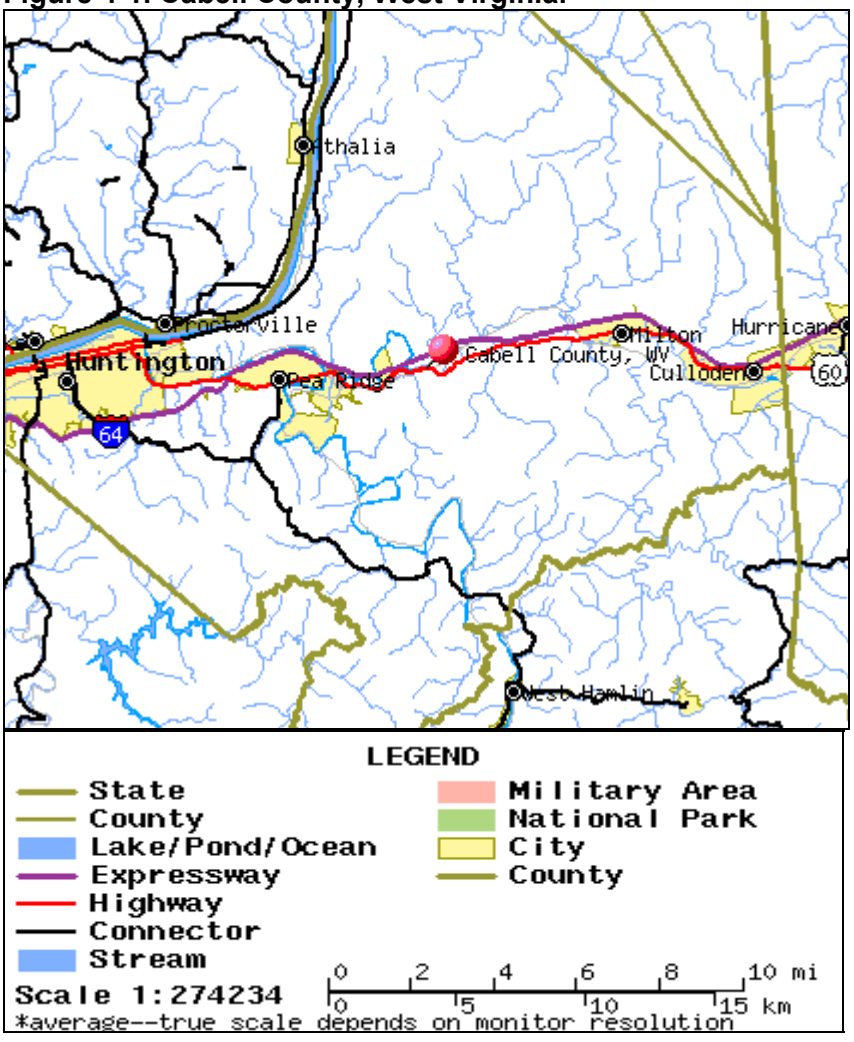
4.0 AFFECTED ENVIRONMENT

INTRODUCTION AND STUDY AREA

The Corps has compiled relevant information about the environment that could be affected by the implementation of the potential Lower Mud River flood control projects at Milton, West Virginia. This information establishes the baseline against which potential impacts are measured.

Milton is located in the east-central portion of Cabell County, West Virginia (Figure 4-1). The study area is limited, for each environmental aspect discussed below, to the area reasonably anticipated to be influenced by a Milton project. This approach focuses the analysis on areas with the potential to be discernibly affected by implementation of a project.

Figure 4-1. Cabell County, West Virginia.



The area of influence for the direct impacts includes the reach of the Lower Mud River in proximity to Milton, West Virginia, the lower reaches of Johns Creek and Newmans Branch,

tributaries of the Mud River, as well as the riparian and wetland areas that would most likely be affected by construction of flood protection measures. This area also includes those portions of Milton that would be directly impacted by construction activities as well as those areas that would be used for borrow or fill materials. The area of influence also includes nearby residences which are not located within the City boundary.

Indirect and cumulative impacts may occur beyond the areas where direct impacts take place. Therefore, where appropriate, the affected environment presented reflects a geographically larger area of influence. As an example for the analysis of socioeconomic impacts; the LRR/EIS considers the potential area of influence to include nearby surrounding communities, and Cabell and Putnam Counties as a whole when examining the secondary and cumulative affects of the proposed action and alternatives.

The baseline environmental information used to develop this section was derived from many sources including scientific literature, Federal agency reports, West Virginia agency reports, personal communications with knowledgeable sources and interested individuals, field studies and reconnaissance conducted as a part of this investigation and other related environmental impact studies. Assessment of the potential effects of the alternatives relative to the baseline conditions discussed for the affected environment is presented in Section 5.5, Environmental Consequences.

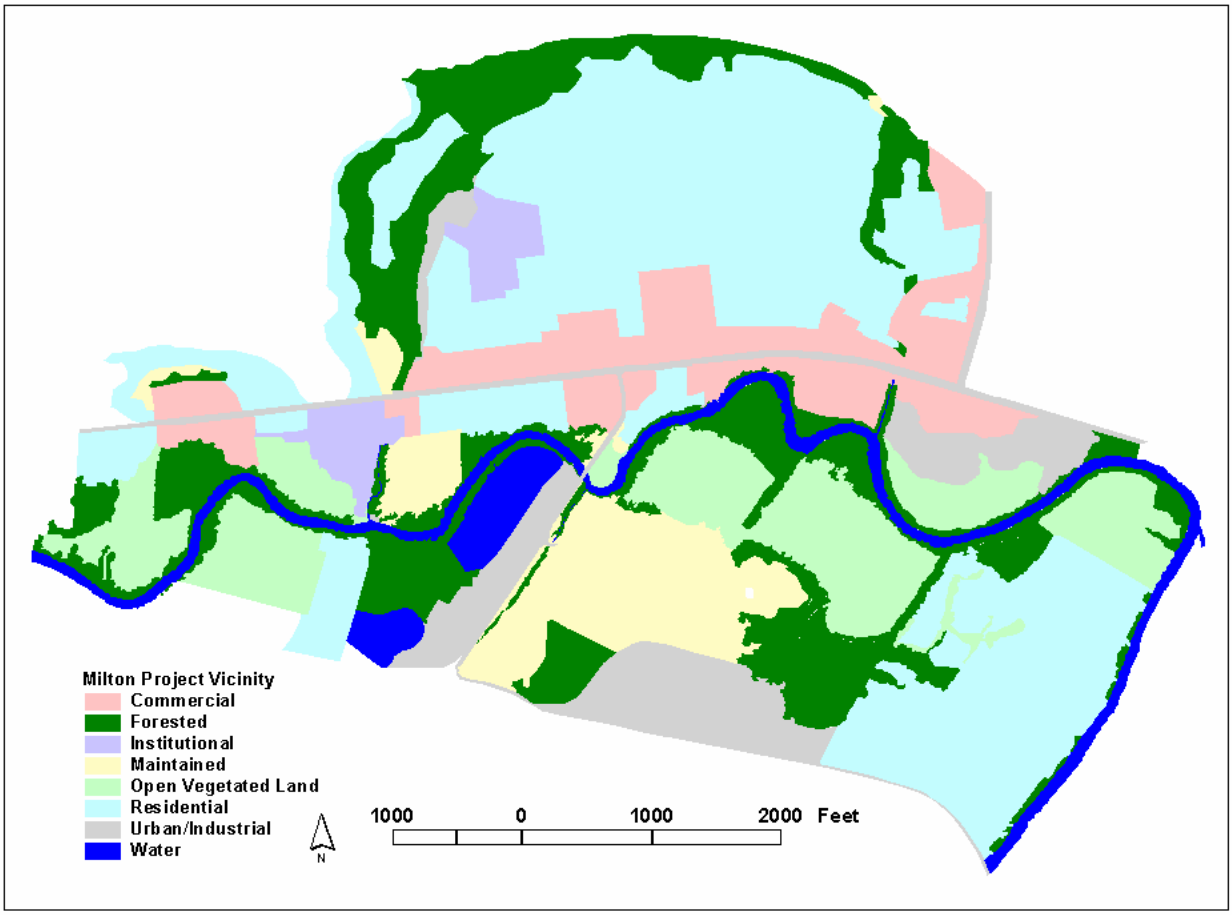
4.1. LAND USE/LAND COVER

Land use characteristics of the City of Milton are comparable to other small floodplains in West Virginia that are located near major streams. Areas that are frequently flooded during small (volume) rainfall events are utilized as agricultural areas or maintained as forested areas and provide a vital environmental resource for flora and fauna. Developable land at a higher elevation is normally used for residential and commercial uses. However in Milton, most commercial development in Milton has clustered along the Route 60 corridor, thus exposing that land use type to significant flood damages from Mud River.

Land use within the vicinity of Milton consists primarily of residential, 34.6%; forest, 18.4%; and open vegetated lands, 12.6%; with a mix of commercial, 9.7%; urban/industrial, 9.0%; maintained, 7.8%; water resources, 5.3%; and institutional resources 2.4%. Figure 4-2 is a map of the land uses and land cover at Milton and vicinity and is followed by descriptions of the above land use classifications. This map is based on interpretation of 1 meter Color Infrared Digital Orthophoto Quarter Quadrangles (DOQQ's) obtained from the USGS. The aerial photography was flown in 1996 and 1997 and there has been no attempt to follow property lines in delineating land use polygons.

The Lower Mud River watershed has a drainage area of 263 square miles. The watershed includes all the area from the confluence of Mud River and the Guyandotte River at Barboursville to the confluence of the Middle Fork of Mud River at Hamlin, West Virginia. The drainage area of the Lower Mud River watershed upstream of Milton is approximately 132 square miles. The Lower Mud River watershed is characteristically different in the upstream section (Hamlin to Milton,WV) compared to the downstream section (Milton to Barboursville,WV). The presence of the ancient Teays River that historically flowed through the Milton and Barboursville vicinity created most of the flat to gently rolling land between St. Albans and Barboursville, West Virginia. Please refer to Figure 4-3.

Figure 4-2. General Land Use Classification of the Milton vicinity



Residential – includes apparent residential structures; driveways, house gardens and surrounding maintained landscapes.

Commercial –includes stores, shops, hotels/motels, gas stations, convenience stores and apparent access, parking, loading and delivery areas that may be associated with them. Second floor residential uses or small intervening residences are mapped as this category.

Urban/Industrial –includes manufacturing, handling and storage facilities, and their associated parking, circulation, loading and other outdoor work areas.

Institutional –includes public buildings, such as schools and adjacent athletic fields.

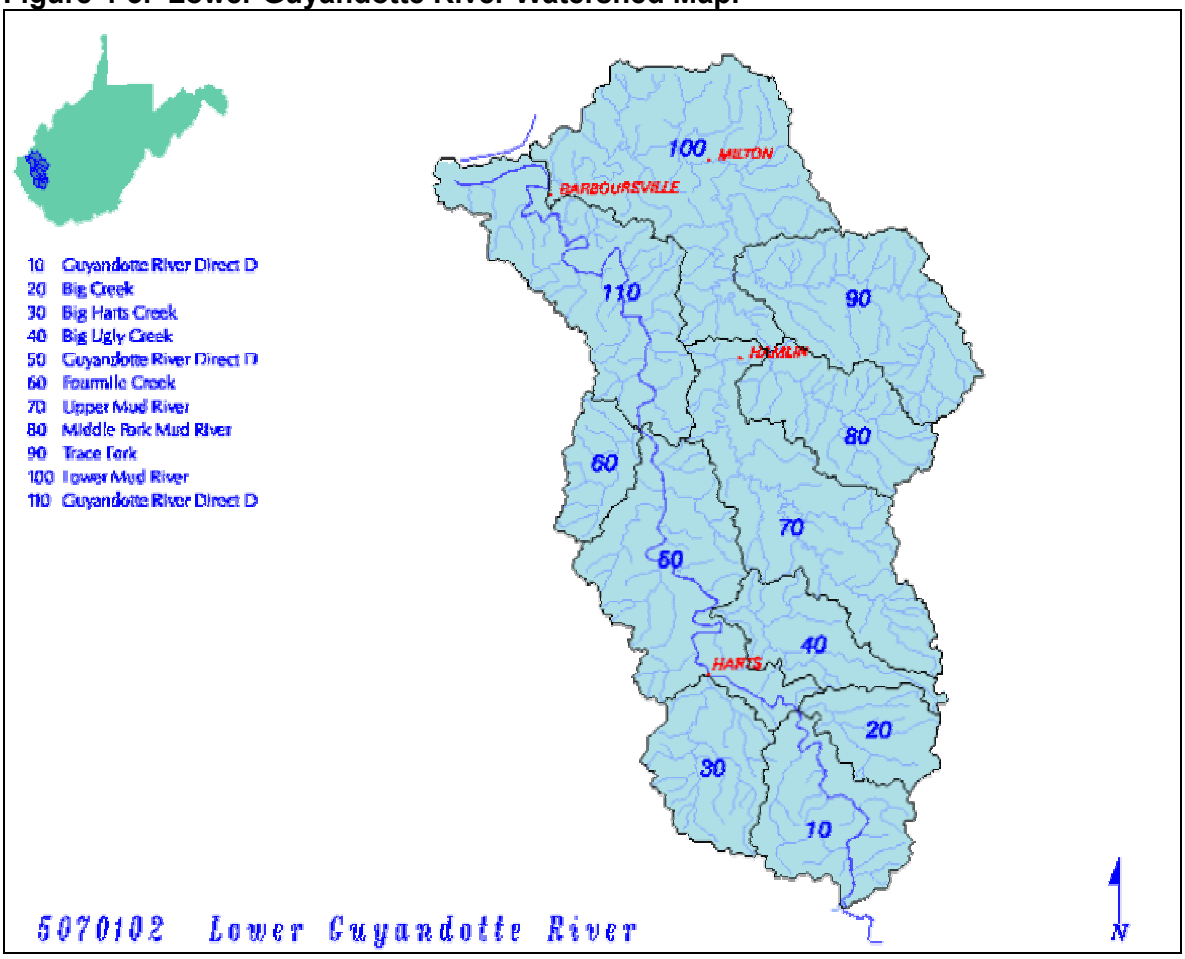
Open Vegetated Land –includes agricultural areas: pasture, hay fields, row crops and all associated residences, barns, feed lots, small ponds and other farm-related features and palustrine emergent and scrub/shrub habitat.

Maintained - includes larger non-agricultural, routinely mowed areas (typically not roadsides), and public parks.

Forested –includes bottomland hardwood forests, early sere riparian vegetation and mixed hardwoods.

Water - includes the open surface waters of the Lower Mud River, Johns Creek, Newmans Creek, and the sewage lagoons and larger ponds in the project vicinity.

Figure 4-3. Lower Guyandotte River Watershed Map.



4.2 TOPOGRAPHY/DRAINAGE

The Appalachian Plateau Province covers the western two-thirds of West Virginia where the rock formations are relatively flat, except for several distinct folds and faults on the eastern side of the Province. The topography to the north and south of Milton is gentle to moderately steep. The drainage is typically dendritic. The Lower Mud River in Milton flows along the ancient Teays River bed from Milton to Barboursville where drainage typically meanders through the valley floor sediment and has formed flat to gently rolling terrain. Figure 4-4 shows the physiographic provinces of the region. Figure 4-5 displays the Landsat image of the Teays valley.

The Teays River valley is distinct in this region of West Virginia due to the differing topography compared to the surrounding areas. The topography ranges in elevation from 560-600 feet and is generally flat or gently rolling, whereas the surrounding areas are steep. At Milton, the river

floodplain changes from a tight corridor into a very flat and wide floodplain. The valley is approximately 5,000 feet wide and reaches its peak width (5,600 ft) near the confluence of the Mud River and Long Branch, then narrows to 1,500 ft at the confluence of the Mud River and Mill Creek. Please refer to Figure 4-5.

4.3 GEOLOGY AND SOILS

4.3.1 GEOLOGY

West Virginia is composed of two physiographic provinces (Figure 4-3.). The western two-thirds is the Appalachian Plateau Province, which is characterized by relatively flat-lying rocks from the Pennsylvanian and Permian strata. All West Virginia mineable coal is located in this province. The valleys are primarily less-resistant shale and siltstone, while the mountain ridges are resistant sandstone and limestone (West Virginia Geological and Economic Survey, 2002).

Cabell County lies in the Appalachian Plateau province. Cabell County surface rocks are of sedimentary origin. The geologic features of the Milton/Lower Mud River area are part of the Pennsylvanian Formation. The paleovalley of the Teays River is the dominant geologic feature in the project area. The Teays Valley is filled with Late Tertiary alluvium and Early Pleistocene lacustrine (lake) clay.

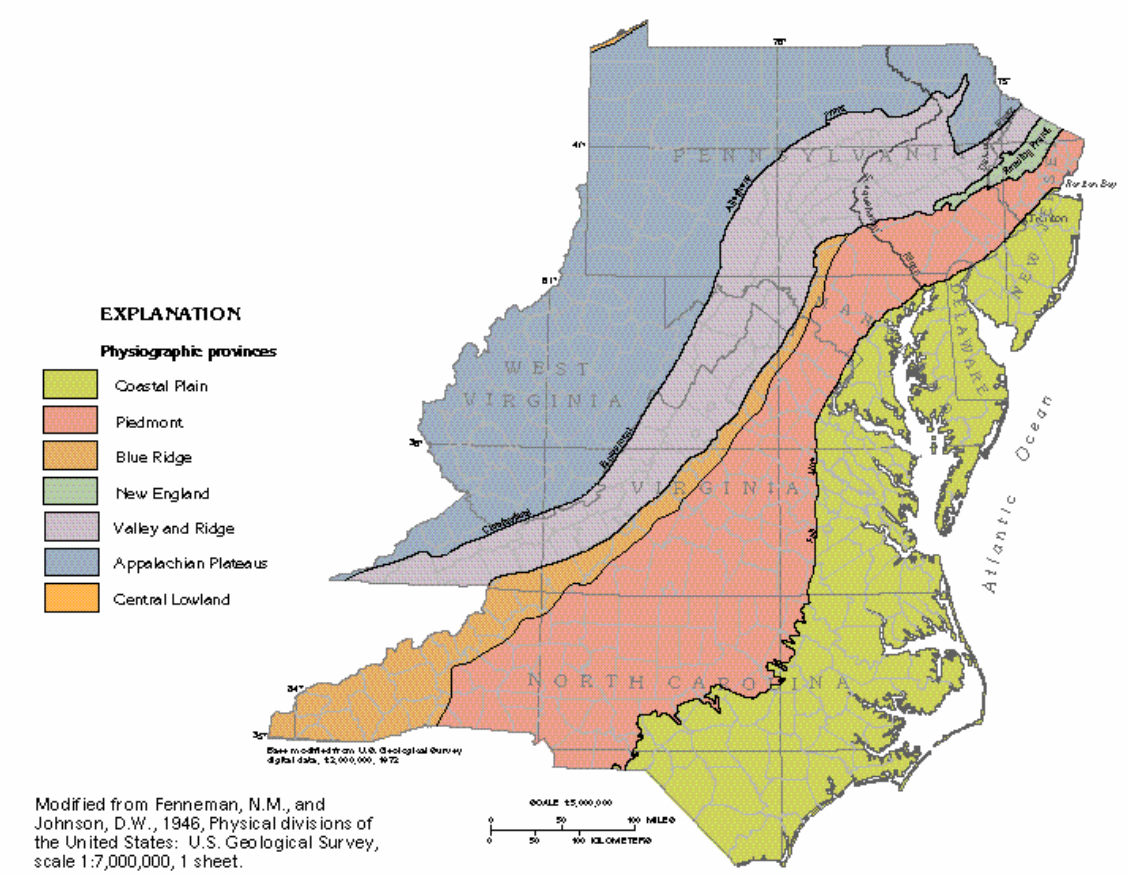
The Ohio River is the major drainage element within the project area but has only occupied its present position since the Late Pleistocene. A prominent paleovalley represents the ancestral trunk river of the ancient Teays River Valley (Kanawha River system) and the preglacial drainage from which the present Ohio River evolved (Figure 4-5). The preglacial Teays drained northwestward from the Blue Ridge of Virginia across West Virginia and Ohio. Its course can be traced by numerous wells in Ohio, Indiana and Illinois, where its westward-trending valley is buried by glacial drift (Thornbury, 1969).

The advance of Pleistocene ice over the ancient Teays River course caused the drainage to shift from the Teays Valley to a route roughly paralleling the glacial boundary. The new course follows the existing course of the Kanawha River from Nitro to Point Pleasant, West Virginia.

Seismic activity is not significant in West Virginia and will not likely be affected by this project. Activity within the last eight years has occurred primarily in central West Virginia. In 1995, an earthquake measuring 2.3 mb magnitude (intensity as measured on the Richter Scale) occurred near the Pocahontas County border in Sinking Creek, Virginia. The largest earthquake on record in southern West Virginia occurred in 1969 and measured 4.3 mb magnitude (VTSO, 2001).

Although mineral resources, including coal, oil/gas, and limestone, are found in Cabell County, none are actively extracted in the project area. One plugged gas well, operated by Simcon Oil and Gas Corporation is located in the Milton proposed project area. It is listed under the farm name WV Pumpkin Festival for well number Z-034, the last permit issue date for which was 4-26-1999. No gas or oil production is reported for this well.

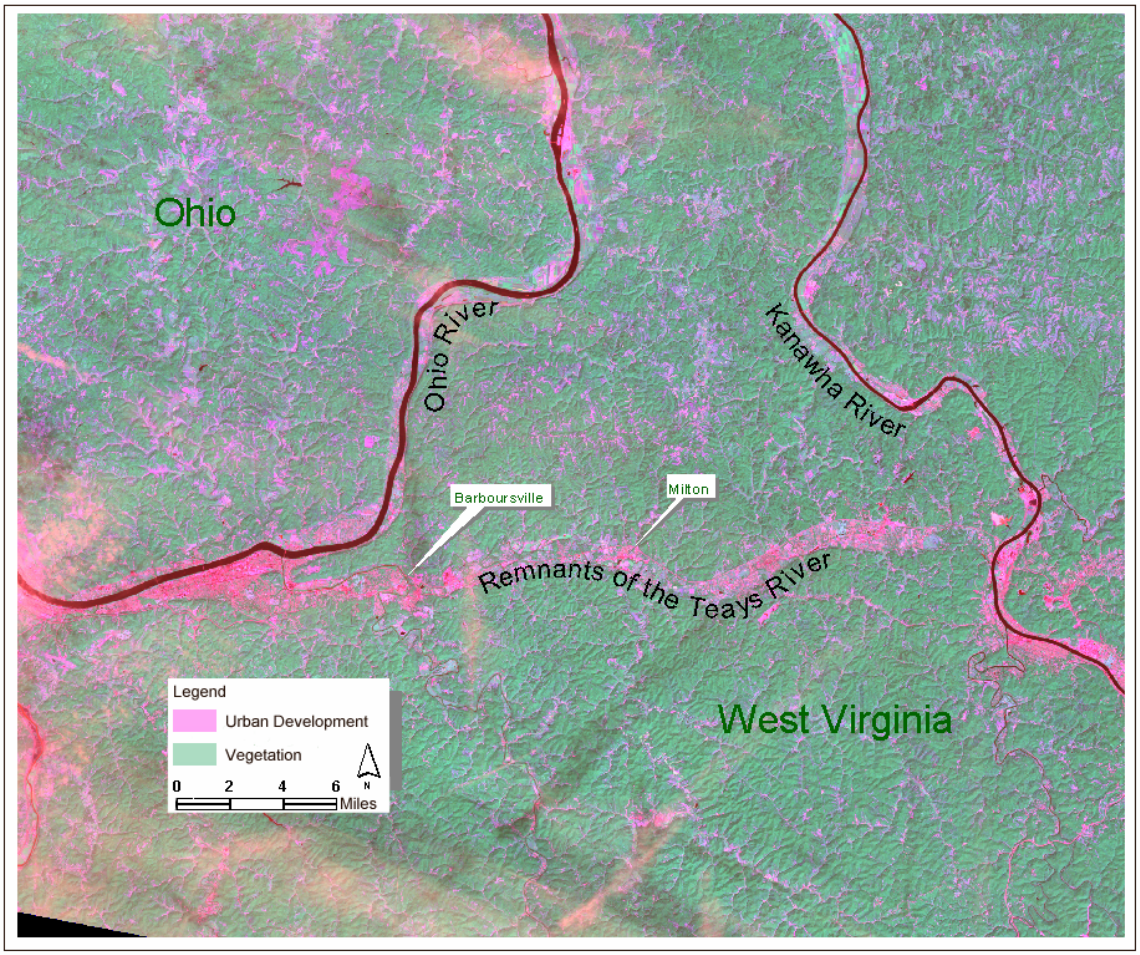
Figure 4-4. Physiographic Provinces of Mid-Atlantic States



4.3.2 Soils

Soils in the Milton area are within the General Soil Map Unit of Kanawha-Chagrin-Guyan. These soils, which are very deep, nearly level to gently sloping, and well to somewhat poorly drained, were formed in alluvial material washed from acid and limy soils on uplands. They are primarily located on floodplains and terraces of the Mud and Guyandotte Rivers. Several are considered prime farmland soils or soils of statewide importance, but developed lands in the project area are not considered prime farmland. Soil types in the Milton area are shown in Figure 4-6 and detailed descriptions of the soils in the project area are provided below.

Figure 4-5. USGS Landsat 7 ETM Image depicting a portion of the Teays River and subsequent development

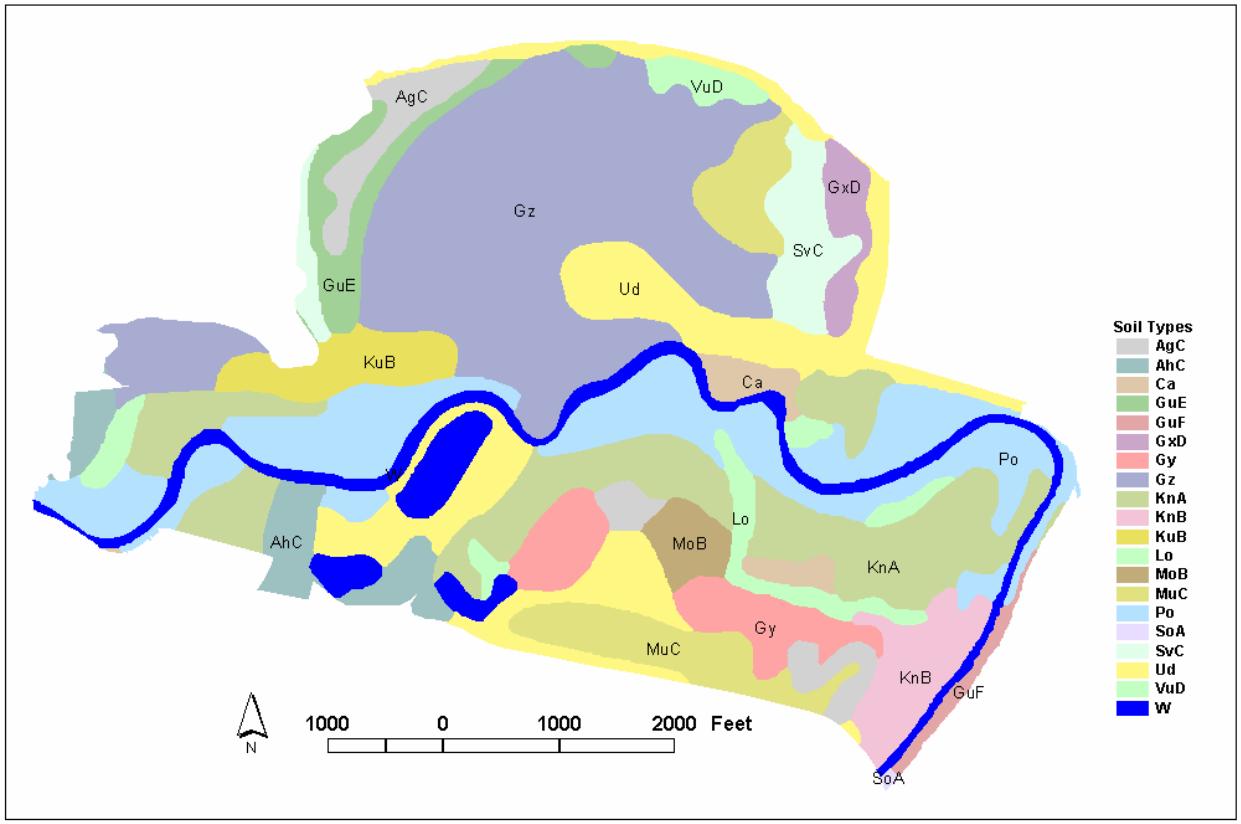


Soil Types

AgC- Allegheny loam, bedrock substratum, 8 to 15% slopes. This soil is deep, strongly sloping, and well drained, and is found on high stream terraces mostly in the Teays Valley. The surface layer is dark grayish brown loam about 8 inches thick. The subsoil is 28 inches thick and consists of yellowish brown loam and strong brown clay loam. The substratum is strong brown sandy loam that extends to shale and siltstone bedrock at a depth of 50 inches. Runoff is rapid and natural fertility is low. This soil is considered a soil of statewide importance

AhC- Allegheny, bedrock substratum, Urban land complex, 3 to 15% slopes. This soil is deep, gently sloping to strongly sloping, well drained, and found in areas covered by buildings, streets, and other urban structures. It is found on high stream terraces of the Teays Valley. The surface layer is dark grayish brown loam and is 8 inches thick. The substratum extends to shale and siltstone bedrock at a depth of 50 inches, and is a strong brown sandy loam. Runoff is rapid and natural fertility is low.

Figure 4-6. Soils present in the Vicinity of Milton.



Ca- Chagrin silt loam, occasionally flooded. This soil is very deep, nearly level and well drained soil that occurs along the Mud River and smaller streams. The surface layer is dark brown silt loam about 8 inches thick. The upper subsoil is brown silt loam and the lower 25 inches is strong brown silt loam and loam. The substratum is brown loam to a depth of 60 inches or more. Slope ranges from 0 to 3%. Runoff is slow or medium, and natural fertility is high. This soil is considered prime farmland soil.

Gy- Guyan silt loam, 0 to 3% slopes. This soil, which is very deep, nearly level, and poorly drained, is found in low stream terraces along the Mud and Guyandotte Rivers. The surface layer is grayish brown silt loam about 6 inches thick, and the substratum is yellowish brown and light gray silty clay loam that extends to a depth of 60 inches or more. Runoff is slow and natural fertility is moderate. This soil is considered soil of statewide importance.

Gz- Guyan-Urban land complex, 0 to 3% slopes. This unit consists of very deep, nearly level, poorly drained Guyan soil and areas covered by buildings, streets, parking lots and other urban structures. The soils and urban land are on low stream terraces along the Mud River. Runoff is slow and natural fertility is moderate.

KnA- Kanawha loam, 0 to 3% slopes, rarely flooded. This soil is very deep, nearly level, and well drained, and is found on high floodplains along the Guyan Creek and the Mud River. The

surface layer is dark brown loam about 11 inches thick. The subsoil is about 34 inches thick and is yellowish brown clay loam and loam. The substratum is yellowish brown loam that extends to a depth of 60 inches. Runoff is slow or medium, and natural fertility is high. This soil is considered prime farmland soil.

KuB- Kanawha-Urban land complex, 0 to 8% slopes. This soil consists of very deep, nearly level to gently sloping, well drained Kanawha soil, and contains areas covered by urban structures such as buildings and streets. This unit is found on low stream terraces and high flood plains. The surface is typically dark brown loam 10 inches thick. The substratum extends to a depth of 60 inches or more, and is yellowish brown loam. Runoff is slow or medium and natural fertility is high.

Lo- Lobdell silt loam is a very deep, nearly level, and moderately well drained soil that occurs on the floodplains of small streams. The surface layer is dark grayish brown and about 5 inches thick. The upper subsoil is about 11 inches thick and is dark yellowish brown silt loam. The lower 19 inches is yellowish brown and dark yellowish brown loam mottled with light brownish gray. The depth to bedrock is more than 60 inches. Runoff is slow to medium and natural fertility is high. This soil is considered a prime farmland soil.

MoB- Monongahela loam, 3 to 8% slopes. This soil is very deep, gently sloping and moderately well drained, and is found on high stream terraces mostly in Teays Valley. The surface layer is brown loam about 6 inches thick. The upper 17 inches of the subsoil is brownish yellow loam that is mottled with light gray. The lower 33 inches of subsoil is a firm and very firm, brittle layer of brownish yellow loam mottled light gray. The substratum is brownish yellow loam mottled with light gray, and it extends to a depth of 60 inches or more. Runoff is medium and natural fertility is low. This soil is considered soil of statewide importance.

Po- Pope fine sandy loam. This soil is very deep, nearly level and well drained and is found on flood plains along the Mud River. The surface layer is dark yellowish brown fine sandy loam about 8 inches thick. The upper 17 inches of the subsoil is dark yellowish brown fine sandy loam and the lower 21 inches is yellowish brown loam. The substratum is yellowish brown that extends to a depth of 60 inches or more. Runoff is slow to medium and natural fertility is moderate. This soil is considered prime farmland soil.

Ud- Udorthents, smoothed are nearly level to very steep, are well drained, and are in areas that have been disturbed by excavating and filling. They are mainly along I-64, U.S. Route 60, and W.V. Route 2, and railroads and urban areas. The surface layer ranges from sandy loam to clay, with a variety of rock fragments. The depth to bedrock is more than 40 inches and bedrock is sometimes exposed. Runoff is slow to rapid and natural fertility is low to high.

4.4 AIR QUALITY AND CLIMATE

This section discusses the climate patterns and existing air quality in the vicinity of Milton, and Cabell County as a whole.

4.4.1 Climate

Cabell County has four distinct seasons. Winters are cold and have a moderate amount of snow while the valley bottoms have intermittent thaws that preclude long-lasting snow cover. Summers range from warm on hillsides to very warm in the valleys. Spring and fall are typically a smooth transition between the seasons. Normal annual precipitation is adequate for all crops (USDA 1992).

The average winter temperature at Huntington is 31.4 degrees F. The average daily minimum temperature in winter is 22 degrees F, and the lowest recorded temperature was minus 15 degrees F in 1963. The average winter snowfall is about 26 inches at Huntington, but it varies greatly from year to year. In summer, the average temperature is 73.2 degrees F with an average daily maximum of 84 degrees F and a highest recorded temperature of 100 degrees F in 1964. Total annual precipitation at Huntington is 41 inches; about 23 inches fall in April through September. Most thunderstorms occur in summer and periods of heavy rainfall can cause flooding in narrow valleys. The sun shines 60 % of the time in summer and 45 % of the time in winter (USDA 1989).

Two distinct types of storms result in floods: summer (May to October) and winter-type (December to March) storms. Summer storms are typically high intensity, short duration and relatively small in aerial extent. The winter-type storms are characterized by less intense rainfall of extended duration falling over a large area. Occasionally, stagnation and stationary developments produce prolonged precipitation. Meteorological records indicate that summer and fall storms occur more frequently and produce more major floods than storms during the winter and spring. All climatic data was obtained from the Huntington, WV NCDC weather station located 20.9 miles from Milton.

4.4.2 AIR QUALITY

The US Environmental Protection Agency (EPA) has established air quality guidelines for several different pollutants, referred to as criteria pollutants, based on the protection of public health and the environment. These air quality guidelines, the National Ambient Air Quality Standards (NAAQS), set limits for the following criteria pollutants: nitrogen oxides (NO_x), carbon monoxide (CO), ozone (O_3), sulfur dioxide (SO_2), lead (Pb), and inhalable particulate matter (PM_{10}). Based on the ambient (outdoor) levels of the criteria pollutants, EPA evaluates individual Air Quality Control Regions (AQCRs) to establish whether or not they meet the NAAQS. Areas that meet the NAAQS are classified as attainment areas, and areas that exceed the NAAQS are classified as non-attainment areas.

West Virginia is divided into 10 EPA AQCRs; all of Cabell County, within AQCR No. 3, is an attainment area for all criteria pollutants (Barlett, 2003). The West Virginia Department of Environmental Protection (WVDEP) monitors air quality and regulates emissions of air pollutants from industrial and commercial facilities to protect the NAAQS. Ambient air quality sampling sites are located throughout West Virginia. These sites monitor air pollutants on a continuous or periodic basis.

In addition to regulating criteria pollutants, EPA works with state and local governments to reduce toxic pollutants. The EPA's Toxic Release Inventory (TRI) does not list any facilities in

Milton (USEPA, 2000). However, there are three facilities in Milton that are permitted by the WVDEP Office of Air Quality (Table 4-1).

Table 4-1. Facilities in the Milton, West Virginia area with Air Permits

WV ID No.	*Facility Name*
WV889078	*Blenko Glass Company Inc.*
WV949582	*Home City Ice Company*
WV922466	*Nicholas Cleaners*

4.5 NOISE

This section discusses the existing noise levels in the Milton area, and describes the basic measurements used for sound. Noise is a potential environmental issue associated primarily with construction and excavation activities and the operation of equipment associated with flood protection facilties.

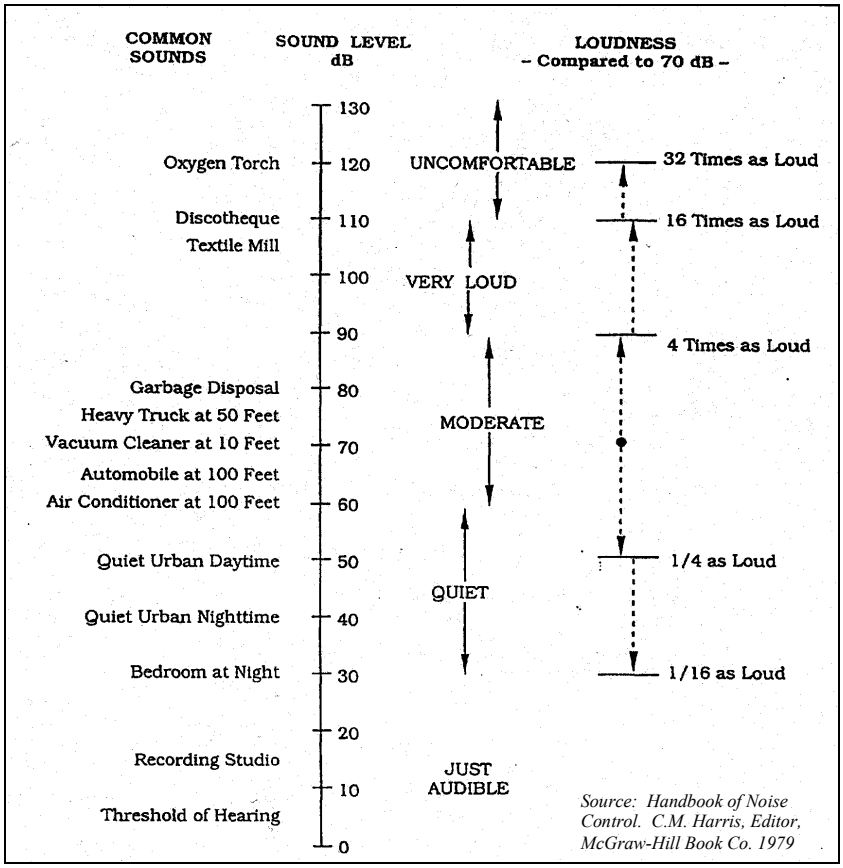
Noise is defined as sound that is undesirable because it interferes with speech, communication, or hearing; is intense enough to damage hearing; or is otherwise annoying. The measurement and human perception of sound involves two basic physical characteristics: intensity and frequency. Intensity is a measure of the sound energy of the vibrations, and frequency is the measure of the tone or pitch of the sound.

The physical unit most commonly used to compare the intensity of sounds is the decibel (dB). The higher the energy carried by the sound, the louder the perception of that sound, and thus, the higher the dB rating of the sound. Normal speech has a sound level of approximately 60 dB. The maximum sound levels of typical events are shown in Figure 4-7.

The second important characteristic of sound is its tone or frequency, which is the number of times per second the air vibrates, measured in Hertz (Hz). All sounds in a wide range of frequencies are not heard equally well by the human ear, which is most sensitive to frequencies in the 1,000 to 4,000 Hz range. To account for this variable response of the human ear to different tones, decibels may be adjusted to A-weighted decibels. The adjusted decibels (dBA) represent the human hearing response to sound.

The U.S. Department of Housing and Urban Development established a day-night average sound level (DNL) standard of 65 dBA for eligibility for federally guaranteed home loans. In 1974, the EPA identified noise levels that could be used to protect public health and welfare, including prevention of hearing damage, sleep disturbance, and communication disruption. Outdoor DNL values of 55 dBA were identified as desirable to protect against activity interference and hearing loss in residential areas and at educational facilities

Figure 4-7. Levels for Common Sounds.



In the Milton project area, current levels of noise are very low as is typical in and around a small town in a rural area. Based on the population density and activity of Milton, the current background noise level is estimated to be approximately 30 dBA (Canter 1977). All existing noise levels are well below what is normally considered compatible with residential land uses and other noise impact guidelines. The primary sources of noise are: 1) everyday vehicular traffic along nearby US Route 60, secondary roadways and bridges; 2) minor construction activities related to maintenance of roadways, bridges, and the other structures and facilities located within Milton and along its waterways; 3) recreation (e.g., groups of hikers, canoeists, fishermen, etc.); 4) natural sounds of the river and wildlife; 5) Interstate I-64, which passes through the northern edge of City and 6) CSX mainline railway on the southern edge of the City. Noise derived from construction and recreation is generally intermittent and highly variable depending on the time of day and year. In addition, the river is not suitable for commercial navigation and only small boats or canoes can use the river for recreational uses.

4.6 WATER RESOURCES

4.6.1 SURFACE WATER AND FLOODPLAIN MANAGEMENT

Hydrology

The Lower Mud River Watershed encompasses drainage from the Lower Mud River watershed below Hamlin, Trace Fork watershed and the Middle Mud River watershed. The total area for the Lower Mud River watershed is 168,320 acres.

Due to the highly variable topography of the watershed, the Mud River is subject to slow changes in flow and runoff. Slow changes in flow can be attributed to the low relief of the Mud River through the Teays Valley glacial deposits. .Slow runoff also can be attributed to backwater on the Ohio River and Guyandotte River during high river events. The Mud River drops approximately 2 feet per mile.

Water Quality

The Office of Water Resources under the WVDEP regulates and monitors water quality throughout West Virginia by delegation from the USEPA, Region 3.

Published data for the project area exists from late 1940s to recent (STORET, WVDEP and USEPA). The only monitoring location near the project area was at Barboursville near the Mud River's confluence with the Guyandotte River. Figure 4-8 shows the name and location of the water sampling station that is located near Milton. Table 4-2 lists the station by name, number, operating agency, and beginning and ending dates of collection, according to STORET. Also included in the table are known exceedances, if any, of water quality standards.

Insufficient data exists to characterize the quality of the Mud River due to the infrequency of routine water quality monitoring in the watershed. The watershed was last sampled by the State of West Virginia in 1998. However, due to unanticipated water depths, very limited chemical sampling occurred at the Barboursville site and no biotic sampling was possible. Under wadeable river conditions, biotic sampling provides for the calculation of WVSCI (WV Stream Condition Index) values. Six benthic metrics are combined into a single multimetric index over a range of 0 to 100. The current established impairment threshold is considered 68. Of four additional state monitoring sites along the Mud River, WVSCI values reported in 1998 ranged from 43 to 72 (fully impaired to unimpaired).

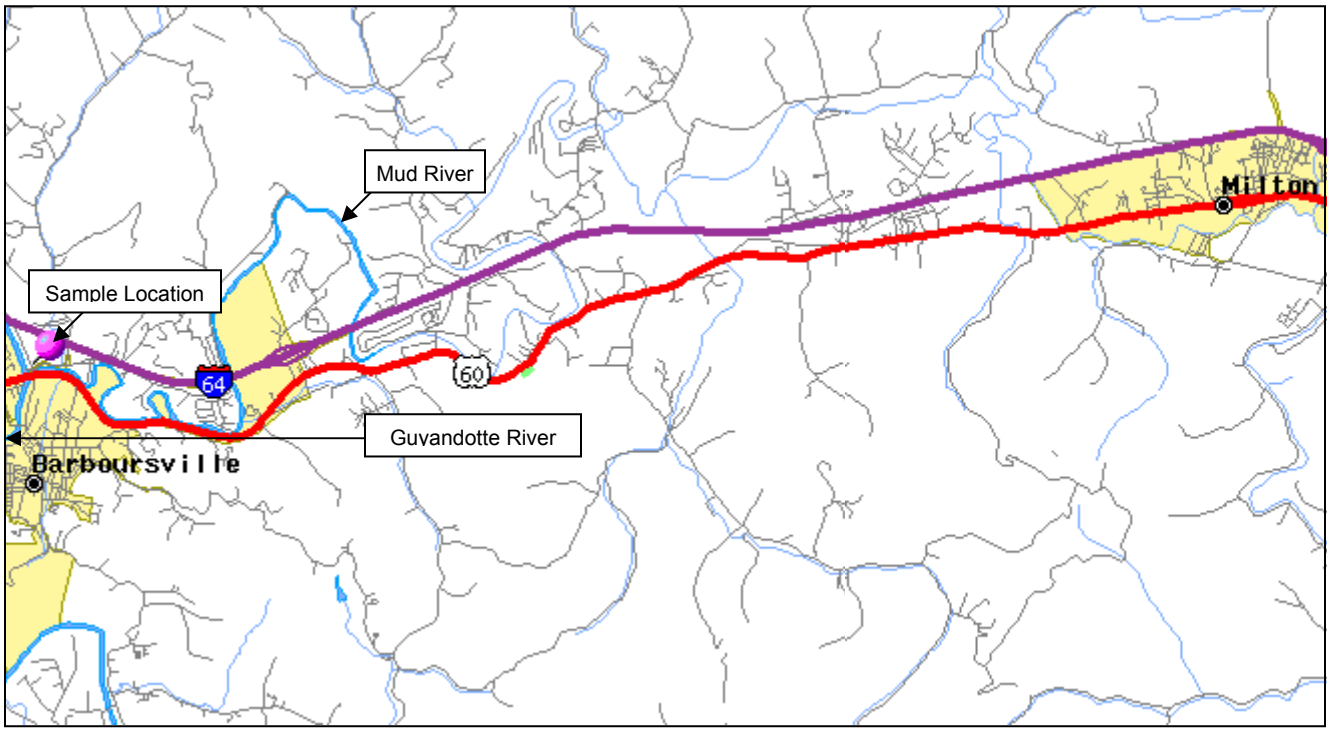
The City of Milton obtains drinking water from the Mud River. A low head dam is utilized to pool the water for the water intake system. The water treatment plant is located on the right descending bank within the City limits, east of the Mud River Road bridge.

Table 4-2.
Water Quality Sampling Station Information and Water Quality Data

Station Name	Station Number	Operating Agency	Data Collection Dates	Water Quality Exceedances[1]		
				Aluminum	Iron	Lead
Mud River at Barboursville, WV Ohio River Guyandotte River/ Mud River	550641	WV Division of Environmental Protection	2/19/74-10/4/79	Exceedances occurred at least once each year, ranging from 150-4,050 ug/L above the Aquatic life, acute exposure limit (750ug/L).	From 1974-1976, measurements ranged from 770-16,800 mg/L. From 1977-1979 measurements ranged from 1,280-7,600 mg/L. [Aquatic life chronic exposure limit = 500mg/L]	Exceedances occurred at least once each year, ranging from 2-110 ug/L above the human health, drinking water limit (50ug/L).
			1/17/80-7/16/84	Measured 2,200 ug/L in 1981 and 1,200 ug/L in 1982. [Aquatic life, acute exposure limit = 750ug/L]	From 1980-1982, measurements ranged from 640-7,400 mg/L. From1983-1984 measurements ranged from 744-19,200 mg/L. [Aquatic life chronic exposure limit = 500mg/L]	None

[1] Water quality parameters that were reviewed include the following: aluminum; chloride; iron; lead; mercury and nitrate-N. Note: parameters measured varied by year. ug/L=micrograms per liter.

Figure 4-8. Location of Water Sampling Station near Milton, WV.



During engineering and design investigations performed by the Corps of Engineers and NRCS for the Milton LPP, soil borings were installed in various spots along the alternative levee alignments to collect geotechnical data and to determine groundwater levels. Piezometers were also installed in selected borings to monitor groundwater levels over time.

Data collected from the piezometers shows that groundwater was encountered at depths of 6 to 19 feet below the ground surface. Groundwater levels measured in the project area are indicative of the alluvial aquifer and are typically influenced by rain fall and groundwater withdrawals. The soils noted in the boring logs indicate the soils are typical of pre-glacial drainage. Interbedded silts and clays were noted in each boring of the Teays Valley.

4.7 ECOLOGICAL RESOURCES

As part of the Scoping Process for the Limited Reevaluation Report, the Corps contracted Marshall Research Group (MRG) to perform baseline ecological assessments in the project area. Due to the timing of the sampling efforts, further sampling was conducted in the Spring 2003. All additional information obtained will be incorporated into the Final Reports. Three reports were produced as a result of that effort and include:

Final Habitat Assessment and Associated Amphibians, Reptiles, and Birds at the Sites of the Proposed Alterations, Milton, West Virginia

Final Flora and Vegetation of Selected Plant Communities at the Proposed Mud River Project, Milton, West Virginia

Draft Mud River Aquatic Assessment Reports.

The Corps also contracted with Burgess and Niple to prepare a *Wetland Delineation Report for the Lower Mud River Project.*

4.7.1 AQUATIC RESOURCES

Aquatic resources within the project area consist of the Mud River, Newmans Branch, Johns Branch, and several wetlands. Project wetlands are described in Section 4.7.1.5. The Mud River is a low gradient, perennial surface water course in western West Virginia, and tributary to the Guyandotte River, which in turn flows to the Ohio River at Huntington. Stream profile is relatively flat, hence the under-development of riffle complexes. A low-head dam located east of West Mud River Road creates a deep pool and is utilized as a source of water for the City of Milton. The Mud River is characterized by unstable banks, noteworthy amounts of fallen timbers and woody debris, and a relatively narrow riparian corridor. Turbidity appears to be pervasive throughout the watershed.

During the fall of 2002, MRG applied the EPA's Rapid Bioassessment Protocol to the river at nine specific impact sites (Figure 4-9). Ten measured variables are used to develop a total habitat score that can be used to compare sites based on habitat quality. The variables include stream cover, embeddedness, velocity, stream alteration, sediment, sinuosity, channel flow,

bank stability bank vegetation, and riparian vegetation. The four categories for the habitat quality variables based on this method are optimal, suboptimal, marginal and poor habitat. Each habitat category is ranked on a scale of 1 to 20 with a possible maximum score of 200. The habitat scores from the assessment for the nine sites ranged from 68 to 98 with an average value of 83 for all sites. The assessment for the Mud River on the survey date ranked the river as marginal habitat.

The aforementioned Newmans and Johns Branches are tributaries that have been previously channelized above their mouths. That channel work has diminished the habitat quality for these tributaries. However, less alteration has occurred over the upstream reaches of both water courses. In fact, two small wetlands occur along Newmans Branch.

4.7.1.2 FISH

Fish species known to occur in the general vicinity of the project area, based on various West Virginia Department of Natural Resources (WVDNR) reports and a study performed by MRG, are shown below in Table 4-3.

Table 4-3. Fish Species Documented to Occur in the Milton Project Area

GROUP	Survey Dates		
Common Name	**1967**	**1982**	**2002**
MINNOWS			
Stoneroller *(Campostoma anomalum)*			X
Common shiner *(Luxilus cornutus)*	X		X
Creek chub *(Semolitus atromaculatus)*			X
Striped shiner *(Luxilus chrysocephalus)*		X	X
Rosyface shiner *(Notropis rubellus)*	X		X
Emerald shiner *(Notropis atherinoides)*		X	X
Silverjaw minnow *(Notropis buccatus)*	X	X	X
Spotfin shiner *(Cyprinella spilopterus)*	X		
Bluntnose minnow *(Pimephales notatus)*	X	X	X
Carp *(Cyprinus carpio carpio)*		X	
River Chub *(Nocomis micropogon)*	X		
Redfin shiner *(Lythrurus umbratilis)*	X	X	
Sand shiner *(Notropis stramineus)*	X		
SUCKERS			
Golden redhorse *(Moxostoma erythrurum)*	X	X	X
Northern Hogsucker *(Hypentelium nigricans)*	X	X	X
Spotted sucker *(Minytrema melanops)*	X		X
White sucker *(Catostomus commersoni)*	X		X
Highfin carpsucker *(Carpiodes velifer)*		X	
Silver redhorse *(Moxostoma anisurum)*		X	
SUNFISHES & BASSES, other Gamefish			
Rock bass *(Ambloplites rupestris)*	X	X	X

Green sunfish *(Lepomis cyanellus)*	X		X
Orange spotted sunfish *(Lepomis humilis)*			X
Spotted bass *(Micropterus punctulatus)*	X	X	X
Bluegill *(Lepomis macrochirus)*			x
Largemouth bass *(Micropterus salmoides)*			X
White crappie *(Pomoxis annularis)*			X
Warmouth *(Lepomis gulosus)*			X
Longear sunfish *(Lepomis megalotis)*	X	X	
Sauger *(Stizostedion canadense)*		X	
Muskie *(Esox masquinongy)*		X	
DARTERS			
Banded darter *(Etheostoma zonale)*			X
Blackside darter *(Percina maculata)*	X		X
Fantail darter *(Etheostoma flabellare)*		X	X
Channel darter *(Percina copelandi)*			X
Johnny darter *(Etheostoma nigrum)*	X		X
Greenside darter *(Etheostoma blennioides)*		X	X
Logperch *(Percina caprodes)*	X		X
DARTERS			
Dusky darter *(Percina sciera)*	X		
Sand darter *(Ammocrypta pellucida)*	X		
OTHER			
Trout perch *(Percopsis omiscomaycus)*	X		X
Brindled medtom *(Noturis miuris)*	X		X
Brook silverside *(Labidesthes sicculus)*	X		X
Least brook lamprey *(Lampetra aepyptera)*	X		

In order to characterize the aquatic habitat specific to the Milton project area, the study area encompassed portions of the Lower Mud River along the affected reach and above and below the potentially affected environment. The 2002 field sampling resulted in the collection of 32 species of fishes. Numerical dominants included silverjaw and bluntnose minnow, stoneroller, hogsucker and rosyface shiner. Sportfish collected by MRG were limited to largemouth and spotted bass and white crappie. The Mud River is a popular musky fishing stream. The West Virginia Division of Natural Resources annually stocks approximately 300 fingerling muskellunge (musky) based upon availability of fish. Fishing pressure for this gamefish is considered strong throughout the Lower Mud River watershed.

4.7.1.3 FRESHWATER MUSSELS

Freshwater bivalves were sampled by MRG (2002) throughout the Mud River project area in the nine areas shown in Figure 4-9, plus an additional four sampling locations that were selected upriver from the Milton area. Within the project reach, no live native mussels were collected. Only *Corbicula,* the exotic asian clam, inhabited the lower Mud River. Three species represented by dead shell material were reported as follows: *Amblema plicata (*Three-ridge), *Lampsilus siliquodia (*Fat mucket), and *Fusconia flava (*Wabash pigtoe). Upriver from Milton, an

additional three mussel species were collected live: *Lampsilus cardium* (Plain pocketbook), *Lasmigona complanata,* (White heelsplitter), and *Quadrula pustulosa (*Pimpleback).

4.7.1.4 BENTHIC MACROINVERTEBRATES

Field sampling for benthic macroinvertebrates was seriously impeded by both the lack of riffle complexes and water depth. Aquatic insects were captured in such small numbers, that further sampling was postponed pending the acquisition of artificial substrate samplers. Additional sampling efforts were conducted in April/May 2003 and additional findings will be incorporated into the final report.

4.7.1.5 WETLANDS

Wetland habitats are also scattered throughout the project area as shown in Figure 4-10. Current wetland delineation procedures require positive indicators of hydrophytic vegetation, wetland hydrology, and hydric soils to be present for an area to be classified as a wetland. Four areas totaling approximately 4 acres of jurisdictional forested and scrub-shrub wetlands were delineated on the site. Two additional jurisdictional wetlands were identified adjacent to the Contractor Work Limits (CWL). Scrub-shrub wetlands were comprised of buttonbush (*Cephalanthus occidentalis*), swamp rose mallow (*Hibiscus palstris*), arrow-leaved tearthumb (*Polygonum sagittatum*), and Japanese honeysuckle (*Lonicera japonica*). Forested wetlands were comprised of sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), river birch (*Betula nigra*), water purslane (*Ludwigia palustris*) and curly dock (*Rumex crispus*). Any impacts to jurisdictional wetlands are subject to regulation under Sections 404 and 401 of the Clean Water Act (CWA). The interspersion of these wetland habitat types with bottomland hardwoods and the riverine community creates greater habitat diversity and increases the fish and wildlife resource values of the area.

4.7.2 TERRESTRIAL RESOURCES

Vegetation

Table 4-4.
Vegetation Along the Lower Mud River Watershed.

	Size (sq. mi.)	Hay/past/grass%	Conifer %	Mixed %	Deciduous %
Lower Mud River	132	7.33	2.31	11.19	66.19
Source: WVDEP 2000					

The more commonly occurring natural vegetation associations found in the project area are described in the following section. Associations occur naturally in response to environmental gradients in moisture and elevation, as well as disturbance resulting from human activity. The composition of these associations is based on botanical field surveys, and boundaries were identified using aerial photography. The locations of these vegetation associations, along with land use features, within the vicinity of the project area are presented in Figure 4-11. Botanical field surveys were conducted from August to December, 2002, and focused on nine zones (9 acres each) distributed throughout the project area along the Mud River (for a total of 81 square

acres). The locations of these zones are shown in Figure 4-9. The plant species identified during the 2002 field surveys are listed in Table 4-5.

In addition to native species, exotic or invasive species are present in the project area and make up 14.6 percent of the total species recorded in the area. Invasive species identified in the project area include chickweed (*Stellaria media*), Japanese honeysuckle (*Lonicera japonica*), autumn olive (*Eleagnus umbellate*), crown vetch (*Coronilla varia*), reed canary-grass (*Phalaris arundinacea*), multiflora rose (*Rosa multiflora*), and tree-of-heaven (*Ailanthus altissima*). Sixteen percent of West Virginia's flora is considered invasive. Non-native species make up 18.6 percent of those identified in the project area, while 26 percent of West Virginia's entire flora is non-native. No rare, threatened, endangered, or sensitive species at the State or Federal level were recorded.

4.7.2.1 Mapped Vegetation Associations

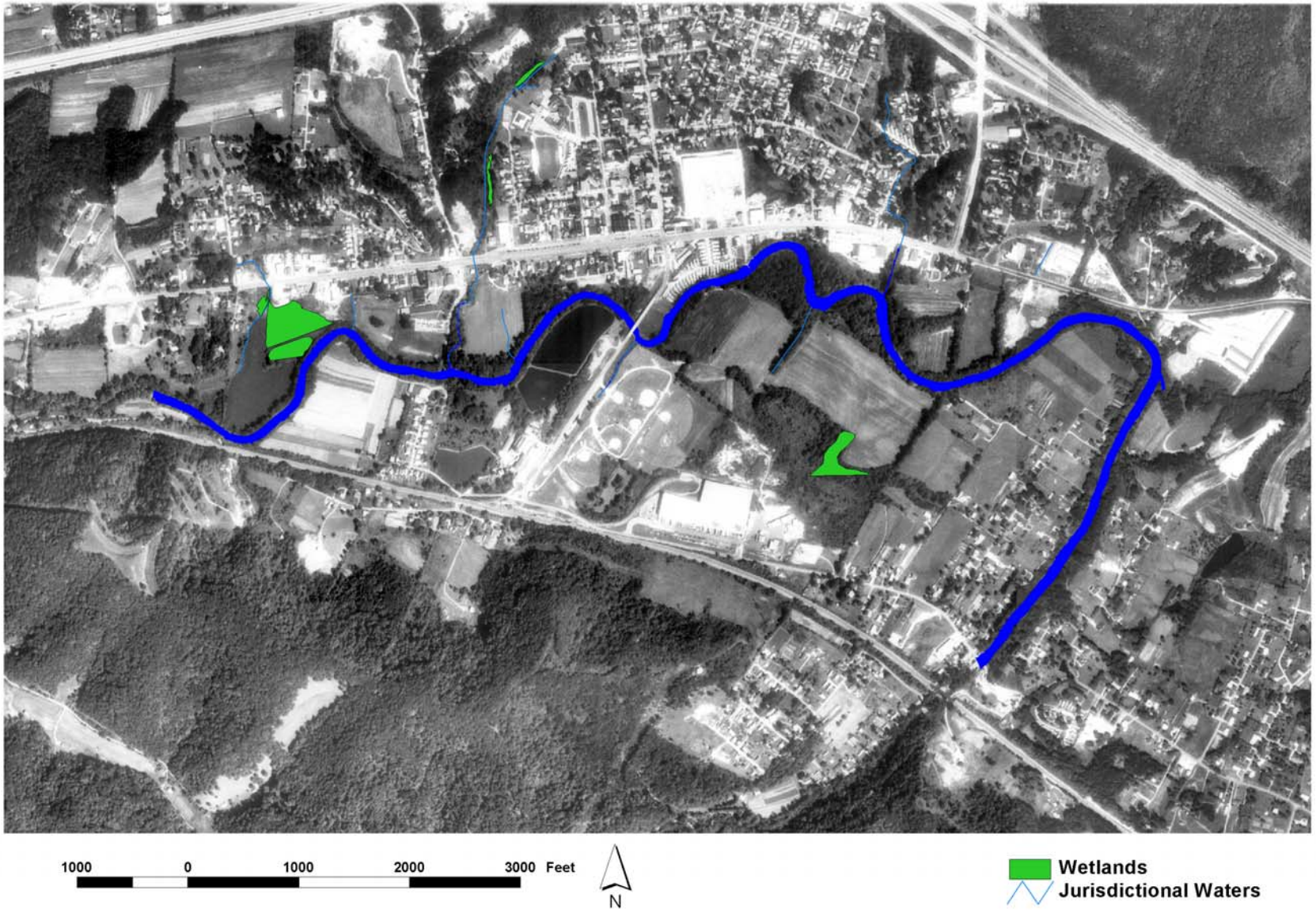
Bottomland Hardwood- These riparian forested wetlands are found along rivers and streams and are periodically inundated or saturated by surface or groundwater during the growing season. Predominant woody plant species are able to survive, mature, and reproduce in a habitat in which soils sometimes become anaerobic during the growing season. (Mitsch and Gosselink, 1993) Bottomland hardwood forests throughout the project area are characterized by stands of box elder (*Acer negundo*), silver maple (*Acer saccharinum*), and sycamore (*Platanus occidentalis*). Ground cover is fairly diverse, and includes species such as elderberry (*Sambucus canadensis*), wintercreeper (*Euonymous fortunei*), ground ivy (*Glechoma hederacea*), multiflora rose (*Rosa multiflora*), spotted ladysthumb (*Polygonum persicaria*), chickweed (*Stellaria media*), goblet aster (*Symphyotrichum lateriflorum*), and common violet (*Viola papilionacea*).

Disturbed Wetland- This unique area was created by excavation and is surrounded in part by fill. It is separated from the Mud River by narrow riparian strip, consisting of silver maple (*Acer saccharinum*), box elder (*Acer negundo*), pokeweed (*Phytolacca americana*), honeysuckle (*Lonicera japonica*), and black locust (*Robinia pseudoacacia*). As a result of excavation and drainage from the steep slopes, the area contains standing water, but species present indicate this is not permanent (white hairy aster (*Symphyotrichum pilosum*) in drier sites; goblet aster (*Symphyotrichum lateriflorum*) in lower, wetter sites).

Early Sere Riparian- This association is characterized by pioneer successional communities that consist of monotypic stands of river birch or cottonwood. (Mitsch and Gosselink, 1993) Important species include river birch (*Betula nigra*), silver maple (*Acer saccharinum*), black willow (*Salix nigra*), woodreed (*Cinna arundinacea*), gray sedge (*Carex grayi*), teal lovegrass(*Eragostris hypnoides*), ground ivy (*Glechoma hederacea*), dwarf St. Johnswort (*Hypericum mutilum*), water primrose (*Ludwigia palustris*), moneywort (*Lysimachia nummularia*), reed canarygrass (*Phalaris arundinacea*), and goblet aster (*Symphyotrichum lateriflorum*).

Figure 4-7. Survey Sites Location Map

Figure 4-8. Locations of Wetlands in the Project Area



Mixed Hardwoods- This varied community of deciduous trees occupies mid-slope terrain where soil is moderately moist and acidic. The forest has a densely closed canopy and crowded understory, but sparse ground layer due to shade. (The Nature Conservancy, 2003)

Open/Agricultural- This association occurs in open fields previously or currently used for agricultural purposes, including crop growth, pastureland, parking for Pumpkin Festival, etc. This association is characterized by the presence of successional species because of severe disturbance from agricultural or recreational use. Important species include Mexican tea (*Chenopodium ambroisioides*), panicled tick-trefoil (*Desmodium paniculatum*), Indian strawberry (*Duchesnea indica*), horseweed (*Erigeron canadensis*), tall meadow fescue (*Festuca elatior*), green ash (*Fraxinus pennsylvanica*), ground ivy (*Glechoma hederacea*), clearweed (*Pilea pumila*), spotted ladysthumb (*Polygonum persicaria*), goldenrod (*Solidago sp.*), johnsongrass (*Sorghum halapense*), *chickweed* (*Stellaria media*), tall ironweed (*Vernonia gigantea*), and common violet (*Viola papilionacea*).

Palustrine Emergent- This wetland association is characterized by erect, rooted, herbaceous hydrophytes (excluding mosses and lichens) which are present for most of the growing season in most years. These wetlands are usually dominated by herbaceous plants (Cowardin et al. 1979) Species recorded in this association included curly dock (*Rumex crispus)*, white clover (*Trifolium repens*), blackseed plantain (*Plantago rugelii*), and path rush (*Juncus tenuis*).

Palustrine Forested- This wetland association is characterized by woody vegetation 6 meters or taller. These areas have an overstory of trees, and understory of young trees and shrubs, and an herbaceous layer. (Cowardin et al. 1979)

Palustrine Scrub/Shrub- This wetland association is characterized by dominance of woody vegetation less than 6 meters tall. Species present include shrubs, young trees, and shrubs and trees with stunted growth caused by environmental conditions. (Cowardin et al. 1979). Species recorded in this association include black willow (*Salix nigra*) and sandbar willow (*Salix interior*).

4.7.3 WILDLIFE RESOURCES

Thirty-seven species of amphibians, 26 species of reptiles, and 95 species of birds could either nest or forage in the identified 4-mile reference reach along the Mud River near Milton. During the fall of 2002, MRG conducted habitat assessments at 9 study areas. Aquatic trapping was conducted with the use of fyke nets and hoop nets. Terrestrial timed constraint surveys using various rakes were conducted in the 9 research blocks. Voice and sight surveying for birds was also conducted.

Table 4-5. Plant Species Observed in Lower Mud Project Area

Ageratina altissima
Acalypha rhomboidea
Acer negundo
Acer rubrum
Acer saccharinum
Acer saccharum
Achillea millefolium
Adiantum pedatum
Aesculus flava
Agrimonia sp.
Ailanthus altissima
Alibizia julibrissin
Alliaria petiolata
Allium cernuum
Allium vineale
Amaranthus spinosus
Ambrosia artemisiifolia
Ambrosia trifida
Ammannia coccinea
Amphicarpaea bracteata
Andropogon virginicus
Apios americana
Apocynum cannabinum
Artemisia vulgaris
Arthraxon hispidus
Asarum canadense
Asclepias syriaca
Asimina triloba
Barbarea vulgaris
Betula nigra
Bidens cernua
Bidens frondosa
Boehmeria cylindrica
Brachyelytrum sp.
Brassica sp.
Bromus sp.
Calystegia sepium
Campsis radicans
Cardamine hirsuta
Carex frankii
Carex grayi
Carex sp.
Carex tribuloides
Carex vulpinoidea
Carpinus caroliniana
Catalpa speciosa
Celtis occidentalis
Cephalanthus occidentalis
Cercis canadensis
Chamaesyce maculata
Chasmanthium latifolium
Chenopodium album
Chenopodium ambrosioides
Cinna arundinacea
Clematis virginiana
Commelina communis
Conoclinium coelestinum
Convulvulus arvensis
Conyza canadensis
Cornus florida
Coroniilla varia
Crataegus sp.
Cryptotaenia canadensis
Cuscuta gronovii
Cynanchum laeve
Cynodon dactylon
Cyperus esculentus
Cyperus odoratus
Cyperus strigosus
Dactylis glomerata
Daucus carota
Desmodium paniculatum
Dichanthelium clandestinum
Digitaria sanguinalis
Diodia virginiana
Duchesnea indica
Echinochloa crus-galli
Eclipta prostrata
Eleagnus umbellata
Eleocharis obtusa
Elephantopus carolinianus
Elymus canadensis
Elymus villosus
Elymus virginicus
Epilobium coloratum
Eragrostis hypnoides
Erechtites hieraciifolia
Erigeron annuus
Euonymus fortunei
Eupatorium fistulosum
Eupatorium serotinum
Eurybia divaricata
Euthamia graminifolia
Fagus grandifolia
Fraxinus pennsylvanica
Galinsoga quadriradiata
Galium triflorum
Geum vernum
Glechoma hederacea
Hedeoma pulegioides
Helianthus sp.
Helianthus tuberosus
Hemerocallis sp.
Hibiscus syriacus
Hydrangea arborescens
Hydrastis canadensis
Hypericum mutilum
Hypericum punctatum
Impatiens capensis
Impatiens pallida
Ipomoea purperea
Juglans nigra
Juncus effusus
Juncus tenuis
Justicia americana
Kummerowia stipulacea
Kyllinga pumila
Lactuca floridana
Laportea canadensis
Leersia oryzoides
Leersia virginica
Lepidium virginicum
Lespedeza cuneata
Ligustrum vulgare
Lindera benzoin
Lindernia dubia
Liriodendron tulipifera
Lobelia inflata
Lobelia siphilitica
Lolium arundinaceum
Lolium pratense
Lonicera japonica
Ludwigia decurrens
Ludwigia palustris
Lycopus americanus

Table 4-5. Plant Species Observed in Lower Mud Project Area (continued)

Lycopus virginicus
Lysimachia nummularia
Menispermum canadense
Microstegium vimineum
Mimulus ringens
Mollugo verticillata
Monarda fistulosa
Morus alba
Morus rubra
Muhlenbergia frondosa
Muhlenbergia sp.
Nyssa sylvatica
Oenothera biennis
Onoclea sensibilis
Ostrya virginiana
Oxalis stricta
Panicum anceps
Panicum dichotomiflorum
Panicum sp.
Parthenocissus quinquefolia
Paspalum laeve
Pennisetum glaucum
Penthorum sedoides
Perilla frutescens
Phalaris arundinacea
Phlox divaricata
Phlox paniculata
Physalis longifolia
Phytolacca americana
Pilea pumila
Pinus strobus
Pinus virginiana
Plantago lanceolata
Plantago rugelii
Platanus occidentalis
Poa alsodes
Polygonatum biflorum
Polygonum caespitosum
Polygonum cuspidatum
Polygonum hydropiperoides
Polygonum lapathifolium
Polygonum pensylvanicum
Polygonum persicaria
Polygonum sagittatum
Polygonum scandens
Polygonum sp.
Polygonum virginianum
Polystichum achrostichoides
Populus deltoides
Prunella vulgaris
Prunus serotina
Quercus alba
Quercus palustris
Quercus rubra
Ranunculus sceleratus
Rhus glabra
Robinia pseudoacacia
Rorippa palustris
Rosa multiflora
Rotala ramosior
Rubus frondosus
Rubus hispidus
Rubus occidentalis
Rubus sp.
Rudbeckia laciniata
Rumex crispus
Rumex obtusifolius
Salix interior
Salix nigra
Sambucus nigra ssp. Canadensis
Sanicula canadensis
Sassafras albidum
Scirpus cyperinus
Scrophularia marilandica
Scrophularia sp.
Sedum ternatum
Setaria faberi
Sicyos angulatus
Sida spinosa
Smilax rotundifolia
Solanaceae sp.
Solanum carolinense
Solanum ptychanthum
Solanum sp.
Solidago altissima
Solidago caesia
Solidago canadensis
Solidago sp.
Sorghum halepense
Stachys tenuifolia
Stellaria media
Symphyotrichum lateriflorum
Symphyotrichum pilosum
Taraxacum officinale
Tilia americana
Toxicodendron radicans
Tridens flavus
Trifolium pratense
Tussilago farfara
Typha latifolia
Ulmus rubra
Verbena hastata
Verbena stricta
Verbena urticifolia
Verbesina alternifolia
Vernonia gigantea
Viburnum prunifolium
Viola papilionacea
Viola striata
Vitis riparia
Vitis sp.

To date, few potential species that could occur in the study areas have been observed. The timing of the survey (fall, 2002) did not allow for the recording of breeding populations of birds or amphibians. Many amphibian species that could occur in the Milton area are difficult to locate outside the breeding season, and many nesting birds migrate south by late summer and will not return until spring. Additional studies were performed by MRG in April/May 2003. Any additional findings will be incorporated in the final report.

4.7.4 THREATENED AND ENDANGERED SPECIES

The USFWS lists federally threatened or endangered species, as well as species of concern. An "endangered" species is one that is threatened with extinction throughout all or a significant portion of its range, while a "threatened" species is one that is likely to become endangered within the near future. Those species that require further biological research and field studies to determine their conservation status are "species of concern." While protection of species of concern is not mandated by the *Federal Endangered Species Act*, the USFWS encourages the consideration of such species in land management planning and natural resource conservation efforts. The State does not designate species as threatened or endangered, but does track rare species. The West Virginia Non-Game Wildlife and Natural Heritage Program, part of the WVDNR's Wildlife Resources Section, tracks federally listed, proposed, and candidate species as well as those rare on a state (S1, S2, etc.) or global basis using the methodologies employed nationally by the Natural Heritage Network. For the purpose of this report, the geographic scope of consideration included only those rare, threatened or endangered species that potentially or historically occur in the floodplain of the Mud River between Milton and Barboursville. Table 4-6 shows the nine species listed by the State of West Virginia as rare species that have been observed and recorded in the floodplain of the Mud River between Milton and Barboursville. All but two of these records are historical, and these species are not expected to occur presently.

The only federally listed endangered species that could potentially be impacted by any alternative at Milton is the Indiana bat (*Myotis sodalis*), which may use the project area for foraging and roosting between April 1 and November 14. Summer foraging habitats are generally defined as riparian, bottomland, or upland forests, and old fields or pastures with scattered trees. Roosting/maternity habitat primarily consists of live or dead hardwood tree species such as shagbark hickory. Such species have exfoliating bark which provides space for bats to roost between the bark and bole of the tree. Tree cavities, splits, or hollow portions of tree boles and limbs also provide roosting sites.

The nearest known hibernating populations of the Indiana bat are in Lawrence County, Ohio, and the Carter Caves Complex in Kentucky (40 and 60 air miles from the project area, respectively). The Carter Caves Complex contains one of the largest known hibernacula for the species, including one Priority I and two Priority III hibernacula. Priority I hibernacula have populations of greater than 30,000 bats, while Priority III hibernacula have populations of less than 500 bats. Bat Cave, located in Carter County, Kentucky, has been designated as Critical Habitat for the Indiana bat. The hibernacula in Lawrence County, Ohio has been designated a Priority III.

Table 4-6.
West Virginia Rare Species that may occur in the Project Area

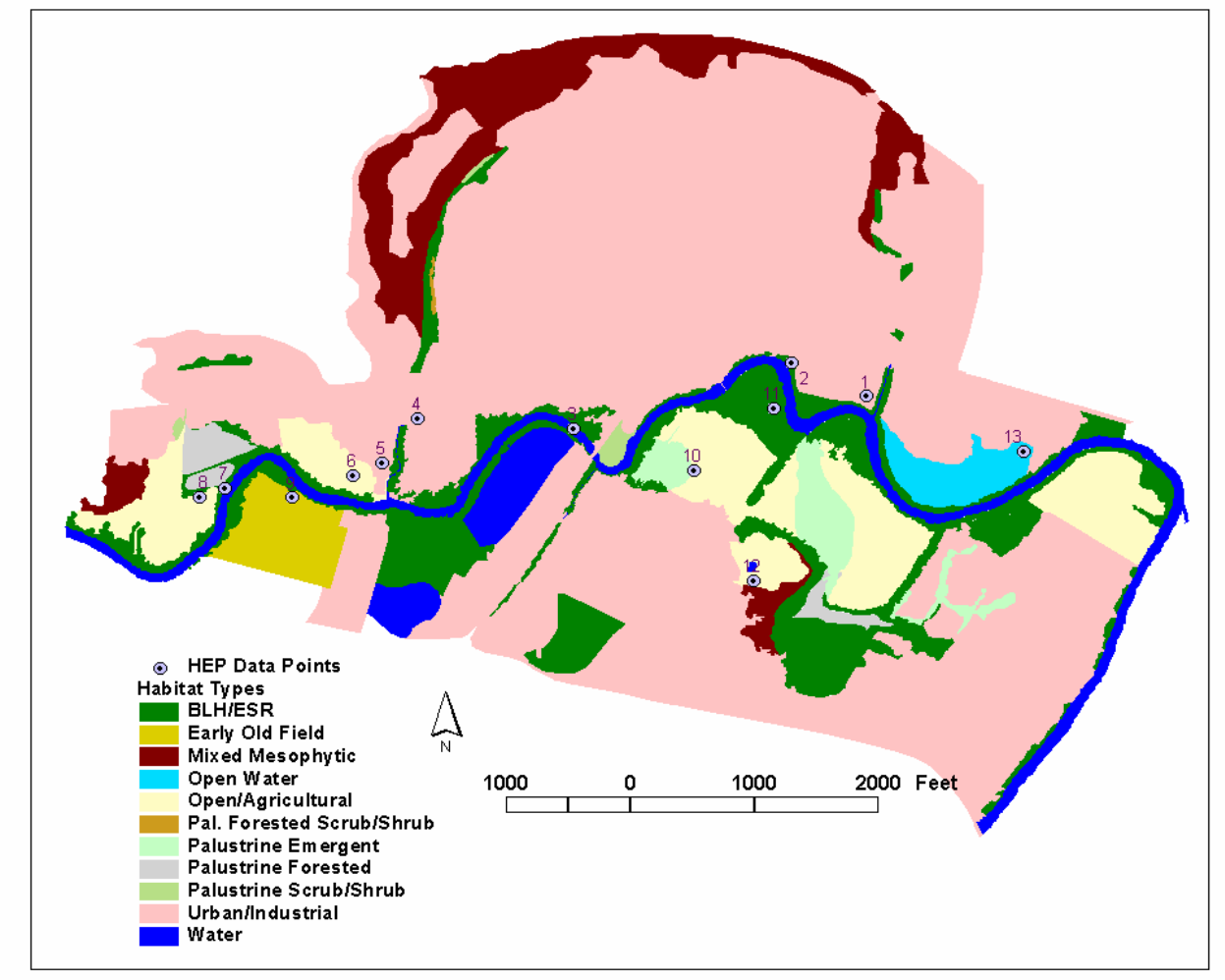
Scientific Name	Common Name	Last Observed	Federal Rank	State Rank
Cryptobranchus alleganiensis	Eastern hellbender	1959	NR	S2
Pseudotriton montanus diastic	Midland mud salamander	1944	NR	S3
Lythrurus umbratilis	Redfin shiner	1998	NR	S3
Percina sciera	Dusky darter	1998	NR	S3
Reithrodontomys humulis	Eastern harvest mouse	1969	NR	S1
Microtus ochrogaster	Prairie vole	1969	NR	S3
Heterodon platirhinos	Eastern hog-nosed snake	1945	NR	S3
Triadenum tubulosum	Large Marsh St. Johns-Wort	1937	NR	S1
Corallorhiza wisteriana	Spring coralroot	1936	NR	S1
WVDNR 2000; WVDNR 2003		NR- not federally ranked	S1- extremely rare and critically imperiled S2- very rare and imperiled S3- may be vulnerable to extirpation S4- common and apparently secure S5- very common and demonstrably secure	

Recent data indicate that the area within an approximate 5.0 mile radius of hibernacula is important foraging and roosting habitat for the Indiana bat in the fall swarming period (August 15 through November 14). The project area is located outside the 5.0 mile radius of known hibernacula; therefore, fall-swarming behavior is not expected in the project area. However, foraging and maternity habitat may occur in the project area.

4.7.5 HABITAT TYPES

The various habitats within the Milton area were mapped as input data for the Habitat Evaluation Procedure (HEP) that would be used later in this study to determine appropriate mitigation of impacts. Figure 4-9 shows the mapped habitat types. The habitat types are defined as follows.

Figure 4-11. Habitat Types in the Milton Area



Bottomland hardwood/Early Sere Riparian – extension of the upland forest into the river floodplains and wetlands.
Industrial – areas associated with industry, including parking lots, storage yards, etc.
Mixed mesophytic – upland forest which is comprised of a variety of hardwood species such as oak and hickory.
Old field – an early successional stage resulting from abandonment of farmland, roadsides, rights-of-way, and open fields or similarly disturbed areas consisting primarily of herbaceous species
Open/Agricultural – an area usable to produce successional plants due to its intensive use or severe disturbance
Open/Sere/Riparian - a series of communities from grass to shrub to forest that terminates in a relatively stable community is a Sere. Riparian is used here to describe habitat that adjoins a stream. Generally, within the project area the Open-Sere-Riparian habitat type is habitat that transitions from open land to the stream edge.
Riparian – areas along the banks of a streams or other water bodies.
Urban – residential or commercial areas, including yards and parks.
Water body – streams, ponds or lakes.

4.8 CULTURAL RESOURCES

Federal agency responsibilities with regard to cultural resources are addressed by a number of laws, regulations, executive orders, programmatic agreements and other requirements. The principal Federal law addressing cultural resources is the National Historic Preservation Act of 1966, as amended (NHPA, 16 USC § 470), and its implementing regulations (36 CFR Part 800), that describe the process for identifying and evaluating historic properties, for assessing the effects of Federal actions on historic properties, and for seeking consultation with the Advisory Council on Historic Preservation and the State Historic Preservation Office (SHPO) regarding those effects. The term “historic properties” refers to cultural resources that are listed on the National Register of Historic Places (NR), that are eligible for listing on the NR, or that may be eligible for listing on the NR. Section 106 of the NHPA requires that Federal agency undertakings take into account effects to these properties and afford the Advisory Council on Historic Preservation an opportunity to comment on those undertakings. Identifying, evaluating, and assessing effects of construction and operation of the Lower Mud flood control project on cultural resources will be done in consultation with the State Historic Preservation Officer (SHPO) and other concerned parties.

4.8.1 PREHISTORIC/HISTORIC FRAMEWORK

The period of earliest human occupation in the Ohio and Kanawha River drainage is the Paleo-Indian period (10500 - 8000 B.C.) which is characterized as a big game hunting culture. The climate at this time was much colder and species such as mastodon, mammoth, musk ox and caribou were hunted. Settlements were widely scattered, temporary occupations. The most characteristic artifacts of this period are fluted projectile points such as Clovis, Cumberland and Folsom.

The Terminal Paleo-Indian period (9000 - 8000 B.C.) is marked by the appearance of a variety of corner- and side-notched projectile points such as Thebes and Dovetails. The Dovetail, Big Sandy Broad Base and "E" or expanded notched points have heavy basal grinding and flaking patterns that are characteristic of Clovis fluted points. They differ from Clovis in that the blades are broader and the bases are notched rather than fluted.

The Early Archaic Period dates from 8000 to 6000 B.C. and is characterized by broad spectrum hunting and gathering. Indians hunted primarily deer and gathered a variety of nuts, berries and other plants. Projectile points become smaller and have serrated edges. Point styles associated with this time period include Charleston, Amos and Kirk corner-notched, Kessell side notched, Kirk and MacCorkle stemmed and MacCorkle indented stemmed. A small number of sites dating to this time period are located near the project area, including the St. Albans Site, a major Early Archaic site located 15-20 miles east of the project area.

The Middle Archaic Period dates from 6000 B.C. to 4000 B.C. It is characterized by increased regionalization and the addition of ground stone tools to the artifact inventory. Ground stone artifacts made by pecking, grinding and polishing include adzes, axes, bannerstones, and pendants. Ground stone tools such as manos, mortars, pestles and nutting stones are interpreted as plant food processing artifacts and indicate increased use of plant foods. Greater regionalization is also noted in new projectile point styles during this period. A variety of bone tools, including antler projectile points, fish hooks and gouges suggest an improved efficiency in

exploiting local resources. Middle Archaic sites tend to contain larger accumulations of materials than those of earlier periods, suggesting an increased group size and/or longer periods of occupation. Chapman (1975) has suggested that Archaic projectile points were probably used in conjunction with the atlatl, a device which increases the distance and accuracy of a thrown spear.

The Late Archaic Period dates from 4000 B.C. to 1000 B.C. It was a time of population increase with more complex social organization. Several wild plants are domesticated during the Late Archaic. These include East Mexican Agricultural Complex plants such as gourd and squash and Eastern United States Agricultural Complex plants such as lambsquarter, marsh elder and sunflower. Straight-stemmed, basal-notched or contracted-base projectile points characterize this period.

The Early Woodland Period dates from 1500 B.C. to 400 B.C. (Hughes & Niquette 1992:17). Two major developments include the manufacture of pottery and the construction of burial mounds. While pottery appears to the north and south about 1000 B.C., the earliest pottery in the mid and upper Ohio Valley appears between 400 and 500 B.C. Most Adena burial mounds date between 400 and 200 B.C.

During this period local Indians continued experimenting with plant domestication and several Eastern Agricultural Complex plants such as sunflower, lambsquarter, little barley, smartweed and maygrass were cultivated. Woodland horticulture is also documented in the analysis of charcoal from Woodland pits which shows an increase in pine and other woods that are associated with land clearing.

The Middle Woodland Period dates from 400 B.C. to A.D. 400. In Central Ohio, the Hopewell flourished and built numerous large earthworks. In West Virginia the Armstrong culture is dated to Middle Woodland. Indians continued living in scattered hamlets and left no traces of earthworks along the Ohio River. Occasionally mica or prismatic bladelets made of Ohio Flint Ridge flint are found on these sites.

The Late Woodland Period dates from A.D. 400 to 1100. The Late Woodland is a period of transition characterized by population migrations and diffusion of major technological and social innovations, and marks a return to a less complex way of life with an increasing dependence on domesticated plants, coupled with hunting and gathering. About A.D. 700 the bow and arrow is introduced and is identified by the presence of Jack's Reef and Levanna triangular projectile points. Shortly thereafter corn is introduced on farmsteads and in small hamlets.

The Late Prehistoric period dates from A.D. 1150 to 1700. By A.D. 1200, Woodland horticulture was replaced by intensive corn agriculture and Woodland hamlets were replaced by large Fort Ancient villages. Principal crops were corn, beans and squash. Diagnostic artifacts include triangular arrow points and shell tempered pottery (Hughes and Niquette 1992).

4.8.2 PREVIOUS CULTURAL RESOURCE SURVEYS

A list of cultural investigations in the vicinity of Milton are shown in Table 4-9.

Kuhn (1981) conducted a generalized archeological survey of the Teays Valley in Cabell County.

In 1986, Marshall University's Department of Geography conducted a historical and architectural survey of the Milton area to determine the exact nature, extent and character of Milton's historic buildings, to develop a tool to assist local government and potential developers in avoiding unnecessary destruction of valuable links with the past and in making practical judgments in community planning and to provide documents to support the nominations of selected buildings in Milton to the National Register of Historic Places.

A preliminary survey of the City revealed a unique array of structures and dwellings possessing significant architectural and historical worth. However, the central business district of City did not possess the necessary concentration and continuity of buildings to merit an historic district, so a Multiple Resource Area classification for the older part of the City was sought.

A total of 12 structures within the survey area were identified that were considered to have historic and/or architectural significance (Table 4-7), and Milton was considered to be eligible for the National Register of Historic Places as a Multiple Resource Area. Formal evaluation and nomination of Milton was recommended. To date, a formal determination as to the eligibility of Milton has not been accomplished.

Table 4-7.
Architectural/Structural Resources

Name/Description	Address/ Location	Year Built	National Register Status
Bowles House	1141 Smith Street	1885, ca.	unknown
Lucian Ball House	1156 Pike Street	1925	unknown
Roberts House	1155 North Main Street	1912	unknown
Meadows Mansion	1181 North Main Street	1898	unknown
Hollandsworth House	1144 South Main Street	1885, ca.	unknown
Hollandsworth House	1144 Rear South Main Street	1930	unknown
Frank Ray House			
Rowsey House (Hotel)	1128 South Main Street	1902	unknown
George Harshbarger House	1026 South Main Street	1902	unknown
First Presbyterian Church	SE corner of Smith and Mason	1897	unknown
"Doc" Morris House	1021 Smith Street	1890	unknown
Parrish Building	1051 Main Street	1907	unknown
Old Bank Building	1105 North Main Street	1905	unknown

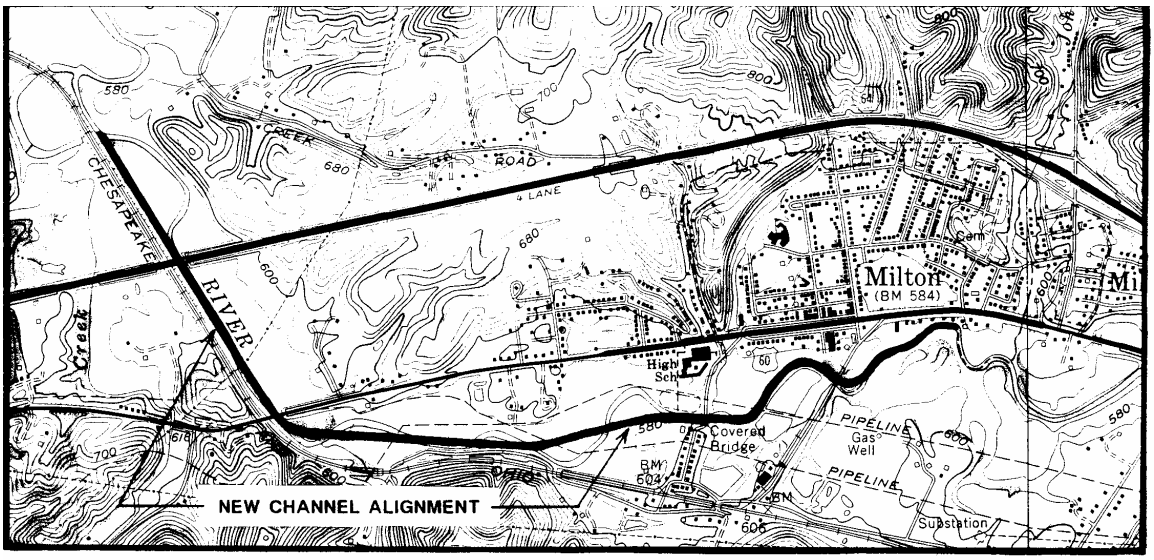
Source: Gillenwater 1986

In March 1989, Soil Conservation Service personnel conducted an intensive archeological/cultural surface survey in an area that would impacted by construction of a channel improvement project to control flood runoff of the Mud River including disposing of soil from this construction in the adjacent field (Figure 4-12). No Phase I report was written, although a general description of the work area was provided in the Technical Specifications of the Phase 2 contract. The site was described as a scatter of lithic debris spread across two slight rises in a field on the south side of the Mud River. Artifacts were flagged, but only a sample of lithic materials was collected. Another walkover of the field in September 1989 confirmed the presence of dense scatters on the two higher areas. Artifacts on the western rise formed a ring, indicating that sub-plowzone remains might occur. Site number 46CB106 was later assigned to this area during a general survey of Cabell County. Lithic tools collected during this survey were described as three projectile point bases, a heavy biface, a biface midsection and a tip, and a thin endscraper. The point bases included a probably Kirk Corner Notched (Early Archaic), a Brewerton Corner Notched (Middle Archaic) and a Matanzas Side Notched (Late Archaic). These were found on or near the easternmost rise. Lithic debitage was mostly Kanawha black chert, although a few examples of brown to tan colored cherts were collected.

Hughes and Niquette (1990) conducted a study concerned with soil associations of archeological sites.

A Phase II archeological evaluation of 46CB108 in the City of Milton, Cabell County, West Virginia, was conducted by Thunderbird Archeological Associates, Incorporated, for the U.S. Department of Agriculture, Soil Conservation Service in 1992. The purpose of this investigation was to evaluate the National Register of Historic Places eligibility of the site and to provide recommendations for further work.

Figure 4-12. Soil Conservation Service Recommended Plan Location Map.



A controlled surface collection was conducted along the two areas of higher elevation described in SCS' 1989 work, with 1m x 1m test units excavated when warranted by the surface collection and shovel tests. One triangular projectile point, indicating a Late Woodland or Late Prehistoric temporal component was recovered from the easternmost rise, along with low frequencies of

formal scrapers, cores and utilized flakes. Debitage analysis showed numerous small flakes, indicating tool maintenance or resharpening. The area was believed to represent a short term, seasonal occupation over many years of use. No further work was recommended for this area of the site.

The second area of study concerned the second rise identified by SCS personnel. Dense artifact concentration was found in Test Unit I-169, leading investigators to believe the possibility of buried cultural deposits dating to the Late and Middle Archaic period exists. Because this second area was the only known buried archeological component within this section of the Mud River floodplain, the site was considered to be potentially eligible for inclusion on the National Register of Historic Places. The sub-plowzone occupation levels and organic preservation of the site indicate the site would likely provide valuable data on small floodplain settlement, overall settlement systems and seasonality.

Phase 3 data recovery in Area 2 was recommended if further impact would occur at this site. Removal of the overlying post-1800 A.D. sediments and hand excavations to define the extent of the buried component and the location of areas of intense activity and midden remnants was recommended, including analysis of macro- and micro-organic materials. Deep testing to determine the presence of earlier buried cultural deposits was also recommended.

A Phase I historic resources review of the proposed relocation site for the Milton Covered Bridge was completed by Thunderbird Archeological Associates, Incorporated, in 1993 for the Soil Conservation Service in Morgantown, West Virginia. The Milton Covered Bridge (built in 1875) was originally included in the Soil Conservation Service (SCS) Milton Local Protection Project, but was subsequently moved by the West Virginia Department of Highways when the SCS project was never implemented. The bridge was moved to the site of a previously existing covered bridge built in 1834 and destroyed in 1956. The Phase I survey was conducted to locate all cultural resources within the project area and to provide a preliminary assessment of their potential significance in terms of eligibility for inclusion in the national register of historic places and to recommend further work if needed. Archival review, oral history interviews and test excavations were carried out in February and March 1993.

The covered bridge relocation site is located at Pumpkin Park. Stone abutments next to a modern highway bridge once supported another covered bridge, built in 1835 and demolished in 1956. County records and historical sources were consulted to determine the history of the relocation site and to see whether historic structures or sites might be located within the area of impact. A ferry was located at this crossing, but no archeological remains pertaining to it were found. Locations of other historic structures and sites associated with the bridge and turnpike were found to be out of the project area. No toll houses for the ferry or the turnpike are mentioned in any sources or were known by informants. Archeological testing revealed deep deposits of alluvial sand and there was no indication of historic or prehistoric archeological remains. No further work was recommended for the relocation site.

The Bridge would not be impacted by any alternative being considered for the Corps of Engineers local protection project, and therefore, has not been evaluated in the impact assessment. West Virginia Department of Highways was responsible for mitigation .

Gardner (n.d.) has written an overview of the Paleoindian and Archaic periods in West Virginia.

Archeological sites recorded on the Milton, West Virginia and the Hurricane, West Virginia 7.5' U.S.G.S. topographic quadrangles and included in site listings contained in Hughes and Niquette (1990) consist of 47 sites within an area reaching from the Cabell/Putnam County line on the east to about six miles west of the project area. Seven are situated in the floodplain and the remainder is found in the uplands. Sites 46CB61, 62, 64, 65 and 67 are located on Charley Creek, a tributary of the Mud River south of the project area and 46CB33 and 76 are situated on the Mud River. A portion of those sites are listed in Table 4-8.

Table 4-8.
Cultural Resource Investigations in Vicinity of Milton, West Virginia

Type of Work	Fieldwork Date(s)	Report
Cultural Overview	n.d.	**Gardner, William M.** n.d. *Paleoindian and Early Archaic Settlement Patterns in West Virginia: An Overview.* West Virginia State Plan, Division of Historic Resources.
Generalized Archeological Survey	1981	**Kuhn, Thomas** 1981 *Prehistoric Settlement in the Teays Valley of West Virginia.* Report submitted to the State Historic Preservation Office, Charleston, West Virginia.
Historical and Architectural Survey	1986	**Gillenwater, Mack H.** 1986 *Milton Historical and Architectural Survey, A Report Submitted to The Cabell County Landmarks Commission, September 30, 1986*
Site/Soil Study	1990	**Hughes, Myra A. & Charles M. Niquette** 1990 *Archeology and Soils, Cabell County, West Virginia.* Report prepared for Cabell County Historic Landmarks Commission, Huntington, West Virginia. Cultural Resource Analysts, Inc., Lexington, Kentucky
Phase 2 Excavation	1992	**Anderson, Sally C. & William M. Gardner** 1992 *Phase 2 Excavations at 46Cb108, Milton, Cabell County, West Virginia, April 1992*
Survey	1993	**Anderson, Sally C. & William M. Gardner** 1993 *Historic Properties Review of the Milton Covered Bridge Relocation Site on the James River and Kanawha Turnpike, Cabell County, West Virginia, April 1993*

Table 4-9.
Recorded Archeological Resources

State Site No.	Site Type	Temporal Affiliation	National Register Status
46CB33		Late Archaic & Early Woodland	not evaluated
46CB61		Early & Middle Archaic	not evaluated
46CB62			not evaluated
46CB64		Archaic, Woodland & Late Prehistoric	not evaluated
46CB65			not evaluated
46CB67	lithic scatter	Early & Middle Archaic	not evaluated
46CB76		Early & Late Archaic	not evaluated
46CB108			not evaluated
46CB117			not evaluated

4.9 SOCIOECONOMIC RESOURCES AND ENVIRONMENTAL JUSTICE

This section describes current socioeconomic conditions within Cabell County and the City of Milton, which is where the majority of potential Milton LPP workforce is expected to reside, based on proximity to the site and historic employment patterns. Cabell County, the third largest county in West Virginia, covers an area of 282 square miles (Fedstats, 2003). Milton is also one of three commercial centers on the Lower Mud River, the others being Hamlin and Barboursville. Because several alternatives may significantly impact one residential area of the community (Harbour Trailer Park), detailed information was gathered and reviewed for the baseline and alternative impact evaluation.

4.9.1 POPULATION AND HOUSING

The total population of Milton is 2,206 (Census, 2000) with fifty-three percent of the population being female. The median age of Milton residents is 38.9 years. Forty percent of the population is between the ages of 25 years and 54 years. Residents over the age of 55 account for 29 percent of the population. Fifty-six percent of the population age 15 years and older are married. Please refer to Figure 4-13.

The United States Census Bureau defines a “household” as all the people who occupy a housing unit. A housing unit is a house, apartment, mobile home or trailer, group of rooms, or a single room that is occupied. A household includes the related family members and all the unrelated people, if any, such as lodgers, foster children, wards, or employees who share the housing unit (U.S. Census Bureau, 2002).

There are a total of 1,112 housing units in Milton. The average household size in Milton is 2.18 people, while the average family size is 2.78 people. Sixty-three percent of these structures are detached single family units. Mobile homes account for 13 percent of the housing structures. Approximately ten percent of the total housing units are vacant while 35 percent of occupied housing units are rented. The average household size of owner-occupied units is 2.22 people and the average household size of renter-occupied units is 2.12. Nearly 31 percent of all households contain individuals less than 18 years of age. Households with individuals 65 years and older comprises nearly 32 percent of the total household population. Family households compose 62 percent of all household types. Of the total family households, 46 percent are married-couple families and 13 percent are single-parent (female) householders.

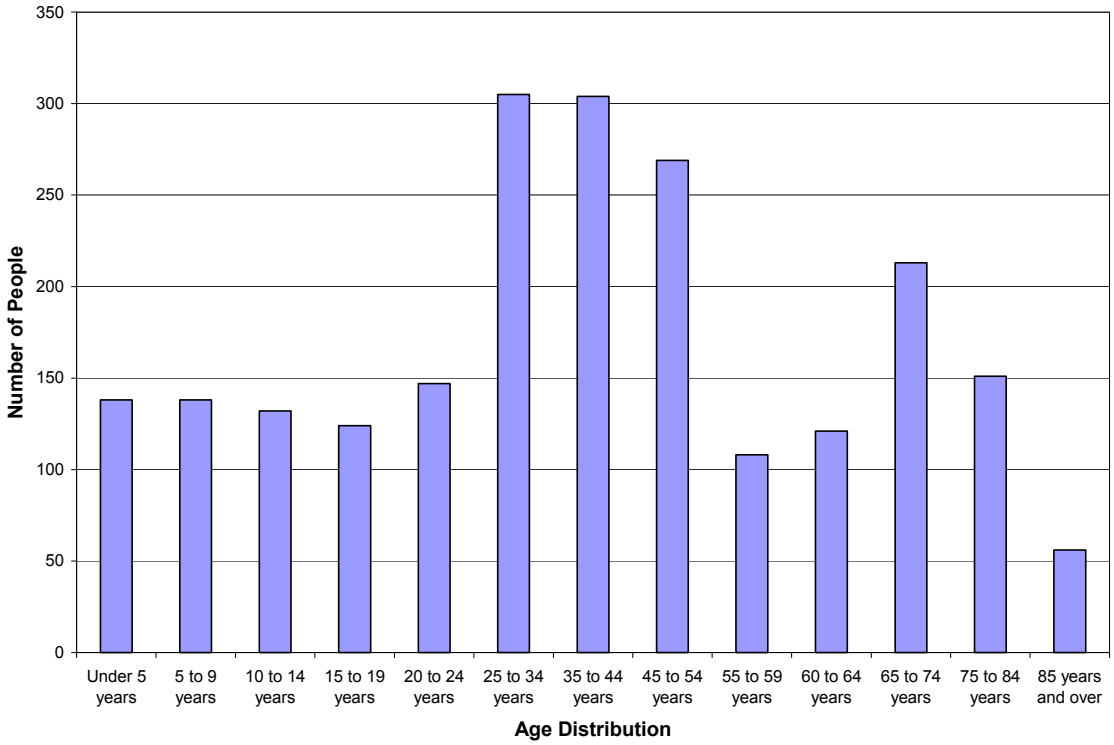
4.9.2 EMPLOYMENT

There are 892 employed citizens aged 16 years and older in Milton according to the 2000 Census. The highest percent of workers (23 percent) are in the educational, health and social services field. Fifteen percent of working population is employed in retail trade, 10 percent work in arts, entertainment, recreation, accommodation, and food services, and 10 percent work in manufacturing industries. Eighty-five percent of the employed residents in Milton ages 16 years and older commuted alone to work in their personal vehicles. Carpoolers account for 12 percent of commuters, while less than 1 percent used public transportation to get to work. The unemployment rate is 3 percent (Census, 2000).

The median household income in 1999 was $29,348. In 1999, 20 percent of households earned between $25,000 and $34,999, 42 percent earned less than $25,000, and 37.4 percent earned more than $35,000. Nearly three percent of the total households in Milton earned more that

$100,000 a year (Figure 4-14). Of the 1,018 households, 46 percent received social security income, 6 percent received public assistance income, and 23 percent received retirement income (U.S. Census Bureau, 2000).

Figure 4-13. Age distribution for residents of Milton, West Virginia.

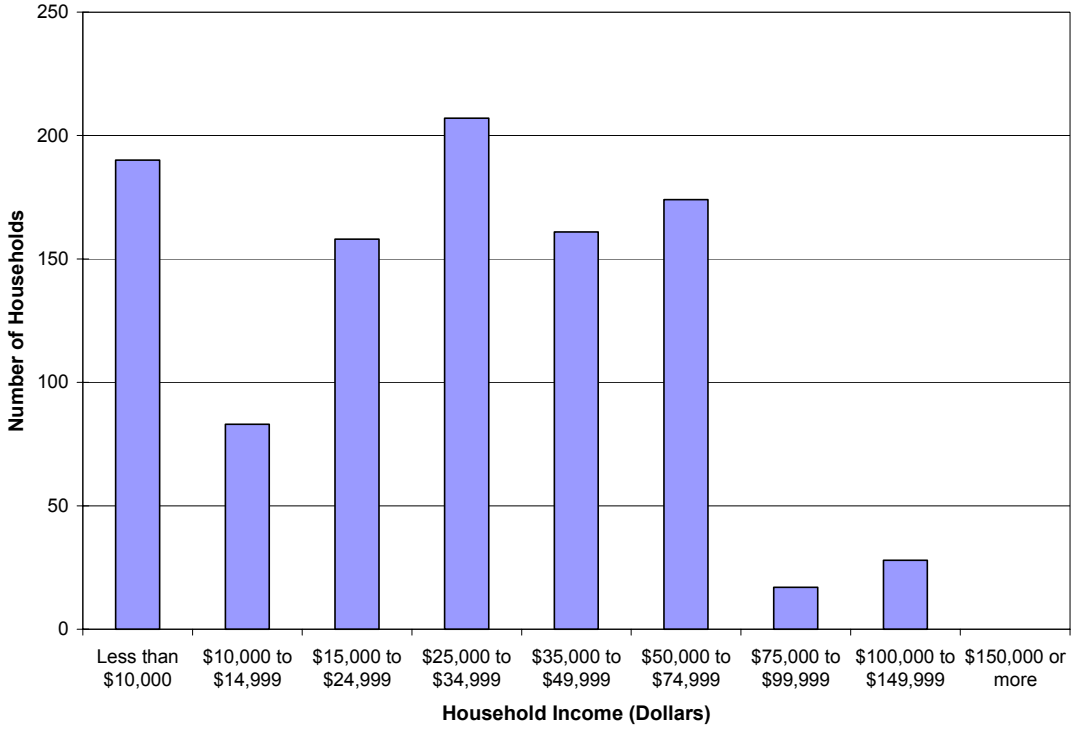


Harbour Trailer Park

Since the Harbour Trailer Park is the primary residential area that could be affected by alternatives being considered for flood reduction at Milton, it has been evaluated in detail. See Figure 2-1 for location of Milton.

Economic and employment data were not available for comparison of the mobile home community to the rest of the City, an interview with the owner of Harbour Trailer Park verified that most of the tenants were retired and living on limited incomes (Harbour, pers. comm., 2002).

Figure 4-14. Household Income for Milton, West Virginia.



4.9.3 COMMUNITY SERVICES

Nearly 41 percent of Milton residents have high school diplomas or higher level degrees and 20 percent have received advanced degrees (i.e. associates, bachelor's, or graduate). An additional 19 percent of the residents have some college experience, but did not receive a degree. Twenty-one percent of the population is comprised of individuals ages 3 years and older who are enrolled in school. Of these, fifty-one percent are in grades one through eight, 22 percent are high school students, and 19 percent are college or graduate school students.

The Milton Volunteer Fire Station - Cabell County Station 400, located at 341 East Main Street, is augmented by the Barkers Ridge Substation, located north of Interstate 64 on Barkers Ridge Road. Collectively, these fire stations serve approximately 6,000 area residents. The Culloden Fire and Rescue Squad provide additional supporting services to the Milton Fire Department, particularly during severe emergencies. The nearest emergency medical facilities are located in Teays Valley, WV at the Putnam County Hospital located 10.4 miles east of Milton.

Public transportation from the Tri-State Transit Authortiy (TTA) is available with service Monday through Saturday to area residents in the greater Huntington area.

4.9.4 COMMUNITY COHESION

Community cohesion is defined as a sense of shared values and purpose, and a tolerance and acceptance of other residents. How cohesive a particular community is can be assessed from learning about the education, religion, land tenure, organization membership status, family distribution, income/wealth, and social behavior of residents.

According to the community representatives that were interviewed, Milton is a small, peaceful city with many positive benefits and is located far enough away from the surrounding larger cities to maintain a rural atmosphere. The size of the City is considered to be one of its greatest strengths by enabling close social connections among the residents. For instance, residents know their children's teachers, they know their neighbors, and they know the history of the families in the City. Many individuals born in Milton remain there and their subsequent generations remain there creating very strong family ties. Furthermore, people who move away from the City typically maintain close relationships with their relatives and former neighbors. There is also a sense of unconditional emotional support within the community; residents rely on each other during times of hardship and need. Milton residents work together to achieve City goals and address local challenges; this is evident by the significant number of people (i.e., 50 to 60 percent of the population) who gather at the bi-monthly City Council meetings. At several City meetings, citizens have expressed their concern about the continual flooding problems in Milton.

Milton contains a predominantly white, Christian community. During interviews, community representatives emphasized that Milton's lack of diversity is not due to the residents' opposition to minorities or their intolerance of different religious beliefs. There is no notable history of racial tension or conflicts among the residents in the City.

Most of the local churches contain small congregations that worship in modest buildings. Some of the older churches are historical structures. There are 12 Christian churches in Milton consisting of Protestant, Baptist and Presbyterian denominations:

1. Bethel Wesleyan Church
2. Bracketville Baptist Church
3. Church in the Valley
4. Freewill Baptist Church
5. Cyrus Creek Baptist Church
6. Lower Creek United Methodist Church
7. Milton Baptist Church
8. Milton Church of Christ
9. Milton First United Methodist
10. Presbyterian Church of Milton
11. Union Baptist Church
12. Evergreen Hill Baptist Church

The Christian Ministries, a collaboration of local churches that pool resources for community outreach, was also described as a unifying force among residents in Milton. Residents express pride in the close relationships between the churches in City and of the importance of the faith community in Milton. Nearly 100 percent of the population regularly attends local churches (Harbour, pers. comm., 2002).

Milton crime rate is very low and residents feel they can "walk up and down the street at night and feel safe." According to the Mayor, there is an average of 126 emergency calls annually from Milton residents, which is a significantly lower number than neighboring communities such as Barboursville and Huntington. Neighborhood Watch groups were initiated in the past, but did not get much support from local residents, who felt there was no need for them.

The community members cite the quality of the school system as an important factor in their decision to raise a family in the area. Milton contains an elementary school (kindergarten to 5th grade) and a middle school (6th – 8th grade). The local high school is located 5 miles outside of Milton in Ona, West Virginia. Schools in Milton are highly ranked within the state and considered to be a major asset to the community.

Community representatives also spoke highly of the City's organizations that work to meet the needs and the specialized interests of the community. Local clubs and organizations include the Veterans of Foreign Wars (VFW) and the American Legion; the Antique Car Club; the Garden Club, which sponsors an annual arts and crafts fair; the Women's Club; the Homemakers Club; and the Brothers of the Wheels, a motorcycle club that delivers lunch to homebound seniors in the area. In addition, the Milton Volunteer Fire Department organizes dance parties for the youth every Friday night, which often accommodate more than 350 attendees. The Milton Flea Market, which is open every weekend, attracts shoppers from all over the region. Milton is served by three newspapers, *The Cabell Record, The Putnam Post* and *Herald Dispatch*, which are important sources of information for community activities and events.

There are a number of tourist attractions in Milton which give residents a feeling of historical significance. Popular City attractions include the historical covered bridge, flea market, the biggest United States flag in West Virginia, and an historic Baptist Church. Every October, Milton sponsors its well-known Pumpkin Festival. The four-day event attracts up to 50,000 visitors from West Virginia as well as other states. Other popular events include the Cabell County Fair, the Corn Maze, and various city parades. Milton residents have a sense of pride for their "one of a kind" tourist attractions.

Harbour Trailer Park

Currently, there are forty-three mobile homes on the property that are occupied primarily by single, elderly, retired widows and homemakers. All of the tenants own their trailers, but rent the land and the facilities. The average age of the tenants is 60 years old and most of them have at least a high school education. The tenants in the Harbour Trailer Park community support themselves financially and some of them receive social security benefits. However, demographically, this appears slightly different than makeup of the city as a whole.

The owner of Harbour Trailer Park emphasized that there are no significant financial or social differences between his tenants and the other residents in Milton. Harbour Trailer Park has a reputation for being a safe, well maintained, and affordable community to live in. There have been no crime cases documented in the mobile home community in the past 25 years. Tenants of Harbour Trailer Park tend to live there for extended periods of time and regularly interact with other residents in Milton.

All of the tenants of the Harbour Trailer Park are required by the owner to have flood insurance since several of the mobile homes have received property damage from past floods. The owner also stated that the tenants would likely be reluctant to relocate because of their attachment to the mobile home community.

4.9.5 ENVIRONMENTAL JUSTICE

In compliance with Executive Order 12898, Federal agencies are directed "to make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States."

The City of Milton has a total population of 2,206 residents. The majority of the city population is represented by white individuals, composing 99.2 percent of Milton. The remainder of the community consists of 0.5 percent African American, 0.7 percent Hispanic or Latino, and 0.1 percent other race (U.S. Census Bureau, 2000). In 1999, the median income per household was $29,348. Approximately 16.6 percent of the families and 17.4 percent of the individuals in Milton are reported to be below the poverty level (U.S. Census Bureau, 2000).

Harbour Trailer Park is comprised of 43 trailers containing 61 residents, all of which are white. A majority of the tenants have a high school education, but some of them have obtained college degrees. A majority of tenants are elderly women who support themselves on limited incomes, such as social security or inheritances. All of the residents in Harbour Trailer Park own the trailer they live in and usually reside there for long periods of time (Harbour, pers. comm., 2002).

4.10 RECREATIONAL AND SCENIC RESOURCES

This section reviews the recreational and scenic resources within the project area was obtained in the area to determine if the proposed alternatives would impact the resources.

Milton offers many recreational opportunities to local residents and tourists. The most popular adult recreational activities are fishing. Sport fish in the Mud River include muskellunge (*Esox masquinongy*). The Milton community also heavily uses local parks and campgrounds, such as Jim's Campground located on the western edge of the City and April Dawn Park located near City Hall. The largest annual recreational event is the Pumpkin Festival, which Milton sponsors every October. This four day event attracts nearly 50,000 tourists. Milton has an annual recreational maintenance and development budget of $16,000, which is managed by the elected officials of the Greater Huntington parks and Recreation Board.

Many adults are active members of various volunteer organizations and clubs, such as the Veterans of Foreign Wars (VFW), the American Legion, the Garden Club, and the Women's Club. Milton youth are also active in community organizations such as Boy Scouts, Girl Scouts, and church youth groups. Meeting times for community organizations are posted regularly in *The Putnam Post* and *The Cabell Record*.

Milton offers designated places to play sports and supports various athletic leagues. Adults frequently use the jogging track and tennis courts located at the schools, as well as basketball courts that are located at some of the churches. Many of the area youth participate in baseball, softball, and football leagues. Baseball and softball games are primarily played at the Milton Little League Field, which is located adjacent to Mud River off of Mud River Road. The baseball fields often flood during rain events because they are in the Mud River floodplain.

4.11 HAZARDOUS, TOXIC, AND RADIOACTIVE WASTES

Prior to any construction activities within the Lower Mud River project work limits, Phase I Hazardous, Toxic, Radioactive Waste (HTRW) Investigations must be completed to identify the potential for contamination and determine the necessity for further investigations. If the Phase I Investigation identifies Areas of Concern, then Phase II HTRW Investigations will be performed. Phase II HTRW Investigations would include site investigations and sampling and analysis to confirm the presence of hazardous substances regulated under CERCLA. If results of the Phase II Investigations confirm that HTRW contamination is present, responsibility and cost of further investigation and remediation of all hazardous substances regulated under CERCLA is that of the local sponsor and/or landowner and shall not be included as a project cost. Contaminated properties subject to remediation of HTRW substances must be remediated prior to initiation of construction activities.

Previously, Phase I HTRW Investigations were performed on 80 tracts. One tract was identified as a potential Area of Concern and is currently in Phase II, although the report has not be completed. A Phase I HTRW Investigation is currently underway for eighty-five (85) additional tracts and, from these 85 tracts, six (6) potential Areas of Concern have been identified.. Phase II activities are ongoing for two areas within the project area, although the report has not yet been completed.

4.12 HEALTH AND SAFETY

The Mud River has a long history of frequent flooding. The Cabell County Commision has been involved in Floodplain Management and zoning since 1987. The Federal Emergency Management Agency (FEMA) has been involved with the City of Milton since 1987. Approximately 140 properties are covered by flood insurance. The health and safety impacts to those in flood prone areas can be numerous, and include outbreaks of infectious diseases, injuries from debris and drowning. Chemical hazards from hazardous or industrial chemicals released in a flood event are also possible.

Fortunately, major outbreaks of infectious diseases are uncommon after flooding disasters in the United States. The most common health impacts occurring from floods affect the gastrointestinal system and are caused by contact with contaminated surfaces and subsequent ingestion of contaminated food or water. The City's sewage treatment lagoons are located west of Mud River Road and south of the Mud River and typically are flooded during a 2-year flood event, releasing partially treated sewage.

There is also a potential exposure to disease caused by vector-borne insects such as mosquitoes, which tend to multiply due to the increase in breeding areas caused by flood waters. After flooding, there is also an increased risk of contracting tetanus from flood-related injuries and exposure to contaminated floodwaters, and the threat of respiratory diseases from the growth of molds and fungi increases. In addition to the physical and chemical hazards that pose potential risks during floods, there is also the potential health impact of stress. Stress associated with displacement and property damage can increase the risk of getting other more serious illnesses.

4.13 INFRASTRUCTURE

This section discusses the existing infrastructure within Milton and focuses on the areas that would be affected by a flood control project.

Numerous roads, including several that are less than 500 feet from Mud River and Johns Creek transect the City of Milton. The majority of the city is located within the 100-year floodplain, including most of the streets. Other types of infrastructure within the city include water, sewer, power lines, gas, phone and cable.

A number of utilities are located within the project study area that may require relocation or abandonment during construction. Aerial telephone lines as well a buried telephone and fiber-optic lines owned by Verizon, AT&T, and Sprint are present. Electric power lines and utility poles are owned by American Electric Power (AEP). Natural gas distribution lines include lines owned and operated by Southern Public Service Company. A 24-inch and 12-inch high pressure gas transmission lines are owned and operated by Union Oil & Gas and Columbia Gas, respectively. Cable television lines are owned by Charter Communications.

Milton Municipal Waterworks operates the City's water plant, all water and sewer lines, and one main sewer lift station all located within the City and surrounding areas.

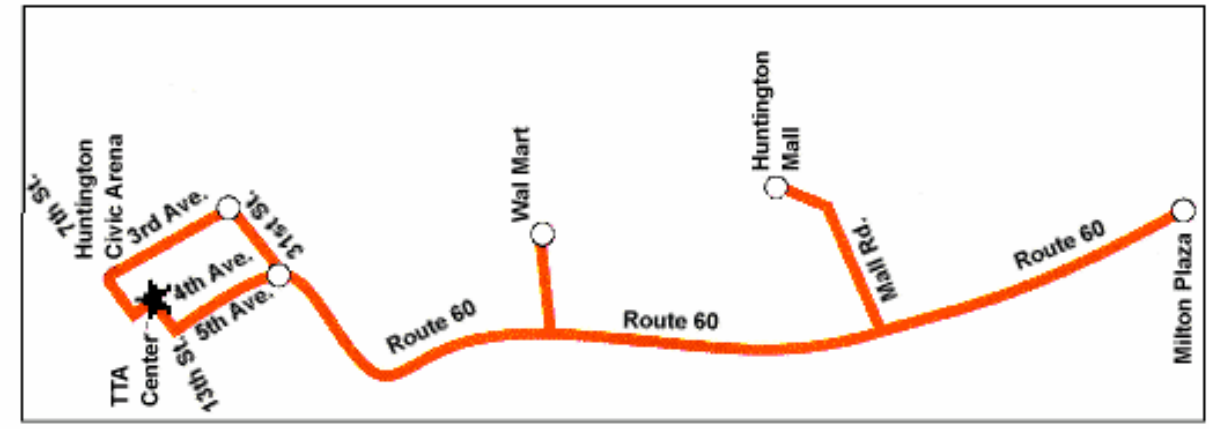
4.14 TRAFFIC AND TRANSPORTATION

This section discusses the existing modes of transportation within Milton and focuses on the areas that would be affected by a flood control project. The most recent traffic level data are also discussed.

Existing traffic patterns in Milton are dominated by daily commutes to and from work, school, or errands. An Average Daily Traffic (ADT) count performed in January, 2003 by the West Virginia Department of Transportation (WVDOT) documented that the two most heavily traveled roads in Milton are US 60 (ADT = 9,200) and CR 13 (ADT = 15,000), which is the community's primary access route to Interstate 64. Approximately 35,500 vehicles traveling daily on Interstate 64 pass over the Milton interchange at CR 13. The traffic counts also indicate that approximately 5,500 motorists per day use the CR 25/7 (Mud River Road) bridge crossing over Mud River and nearly 4,100 motorists use CR 25 (Highlawn Avenue) daily. Smith Street and Main Street are generally the most heavily traveled streets within the downtown area; no specific ADT data exists for these roads.

The Tri-State Transit Authority (TTA) provides public transportation services Monday through Saturday to area residents in the greater Huntington area. TTA buses travel from Huntington to Milton via bus Route # 9 along U.S. 60 (Figure 4-15). Residents may access the TTA buses at the Milton Plaza shopping center, located adjacent to U.S. 60, and at Walmart and the Huntington Mall in Huntington. Bus Route #9 has an approximate daily ridership of 300 passengers that represent a wide range of age groups.

Figure 4-15. The TTA bus route between Milton and Huntington, West Virginia.



AMTRAK passenger trains on Route #50 and Route #51 pass through the southern perimeter of Milton in the morning and evening, but do not stop in Milton. Rail freight and coal cars also pass through the project area at varying schedules.

The streets in Milton flood during significant rain events, often rendering them impassable by vehicles. For instance, during the 1997 flood, U.S. 60 in Milton was submerged under two feet of water, resulting in the closure of schools and businesses.

4.16 FUTURE WITHOUT CONDITIONS

The without project condition is defined as the most likely condition expected to exist in the future in the absence of a flood control project at Milton or the "no action" consequences. This section forecasts the without project conditions and is used as a benchmark for comparison to the alternatives considered in this report.

Land use in the project area has changed little over the past 40 years and this would be expected to continue for the future without condition. Sixteen properties within Milton were purchased by FEMA after the 1997 flood event . The properties can not be used for development. Future flooding, the risk of flooding and rising cost for insurance could result in more abandonment of residential properties. However, there are currently two new restaurants and bank that have opened in the last five years.

Milton lies between the two largest cities in West Virginia, Huntington and Charleston and is considered a "bedroom" community for the two cities. Over 35.000 vehicles pass the Milton Interstate 64 exit everyday. Overall, the economy in Milton is relatively stable and the unemployment rate is very low. The Milton City Council is continually trying to recruit outside businesses. Milton is considered an economically advantageous area for businesses which benefit from significant tax incentives. Blenko Glass Factory, Morris Memorial Nursing Care Facility, and two of the largest schools in the county are a result of Milton's business development strategies. There are also a number of industrial centers and plants within a 30-mile radius of Milton. The majority of people employed in these factories prefer to live in Milton, because of its remoteness from the more industrial and polluted areas of the state.

The City Council is continually working to maintain Milton as an appealing place to live. As previously mentioned, outside investors and business owners are attracted to Milton because of tax incentives. Several significant local capital investments have also been made including the extension of a Senior Citizens Center and the reconstruction of April Dawn Park located near City Hall. The Milton City Council is also investing significantly in new recreational opportunities such as a water park and the future Midland Trail, a proposed bike trail between Huntington and Charleston. In recent years, the City has applied for beautification grants, but did not qualify due to the small population size. When asked to forecast future changes in Milton, the community representatives expressed concern about the increasing tendency for youth to leave the area permanently after attending college. The primary reason for this trend is the lack of high-paying professional jobs in the area. Overall, the economy in Milton is relatively stable and the unemployment rate is very low.

Within the watershed there is the potential development and employement opportunities in the future with the following activities: construction of the Western Regional Airport (2010), the 35,000+ vehicles (potential business) that pass Milton every day on I-64, the new regional jail (jobs) and expanding mall (jobs) located 7 miles east of Milton and the potential expansion of I-64 to six-lanes adjacent to Milton area in the future. Some growth will take place in Milton in the future in accordance with the NFIP. Should the airport go in around 2010, the value of all of the property in Milton will probably rise and undeveloped land will become extremely valuable. There is likely to be explosive growth of residential and commercial business within the region following the airport's initial operation. Milton and the developable property within the watershed above Milton will share in that growth. Lack of adequate flood protection will suppress Milton's economic future in this growth period.